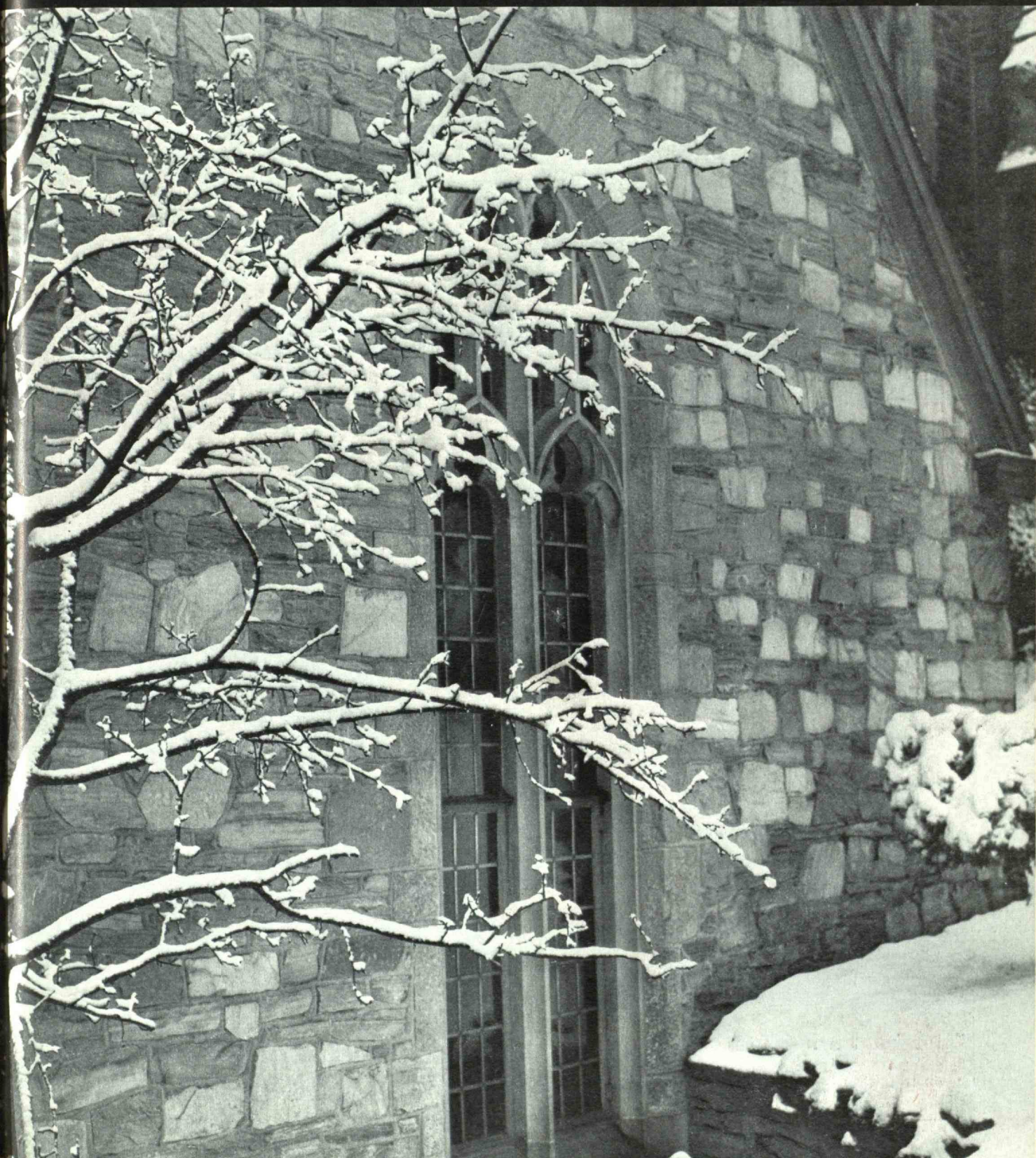


# TECHNOLOGY

## REVIEW *January* 1951



# technology review

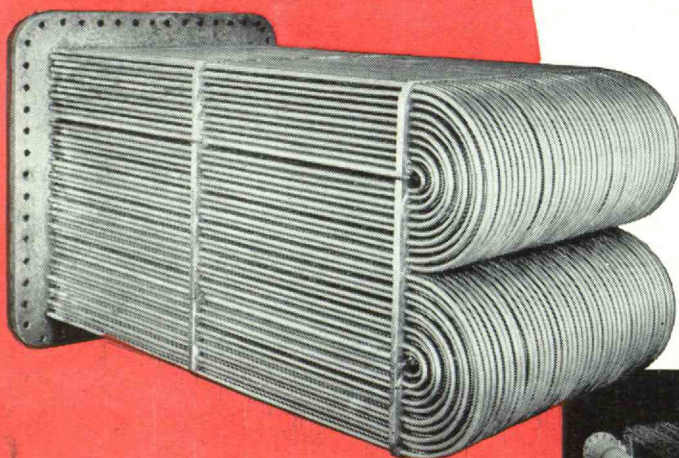
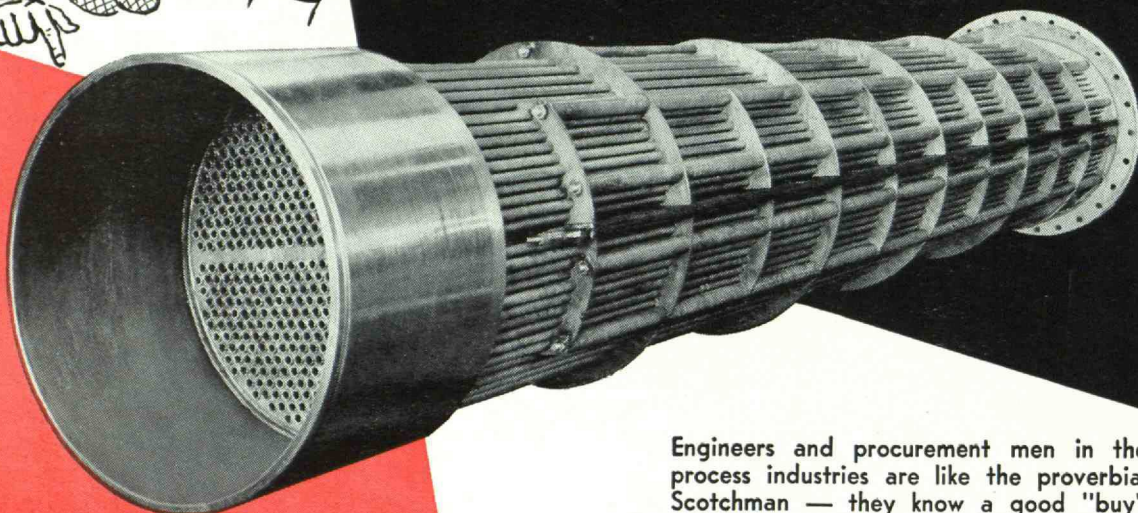
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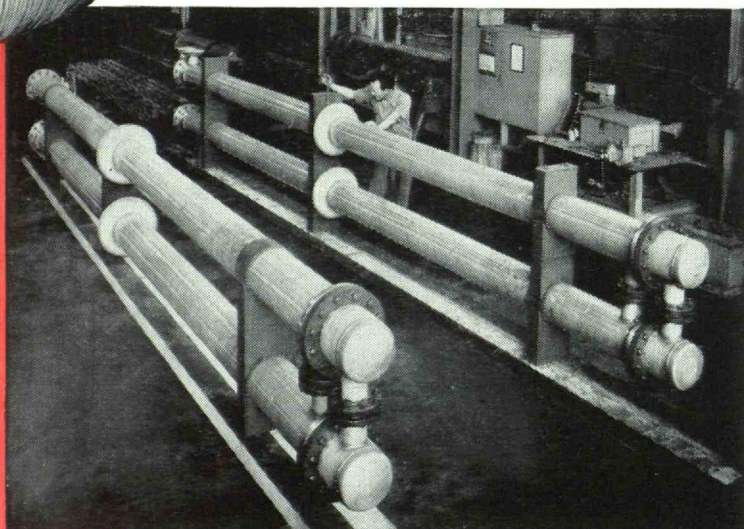


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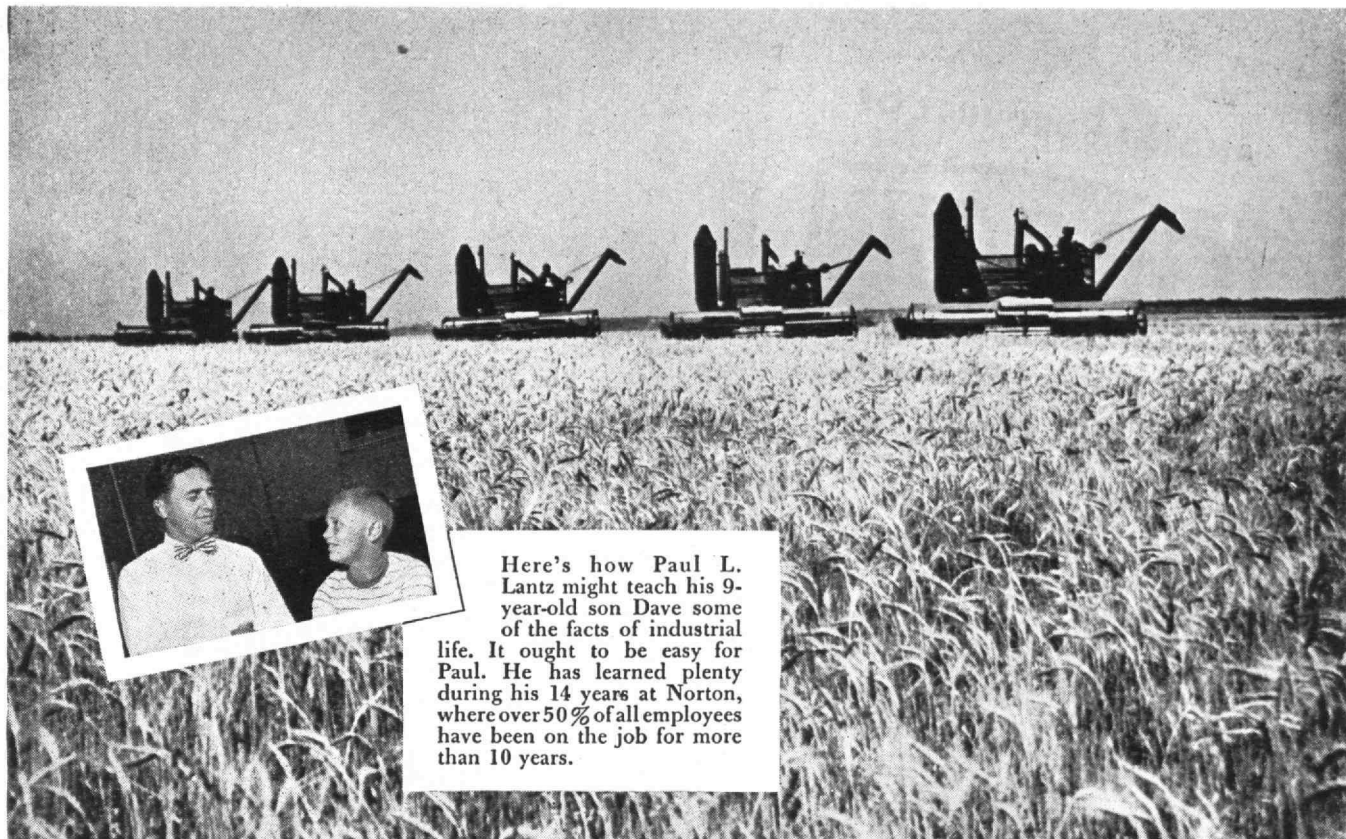
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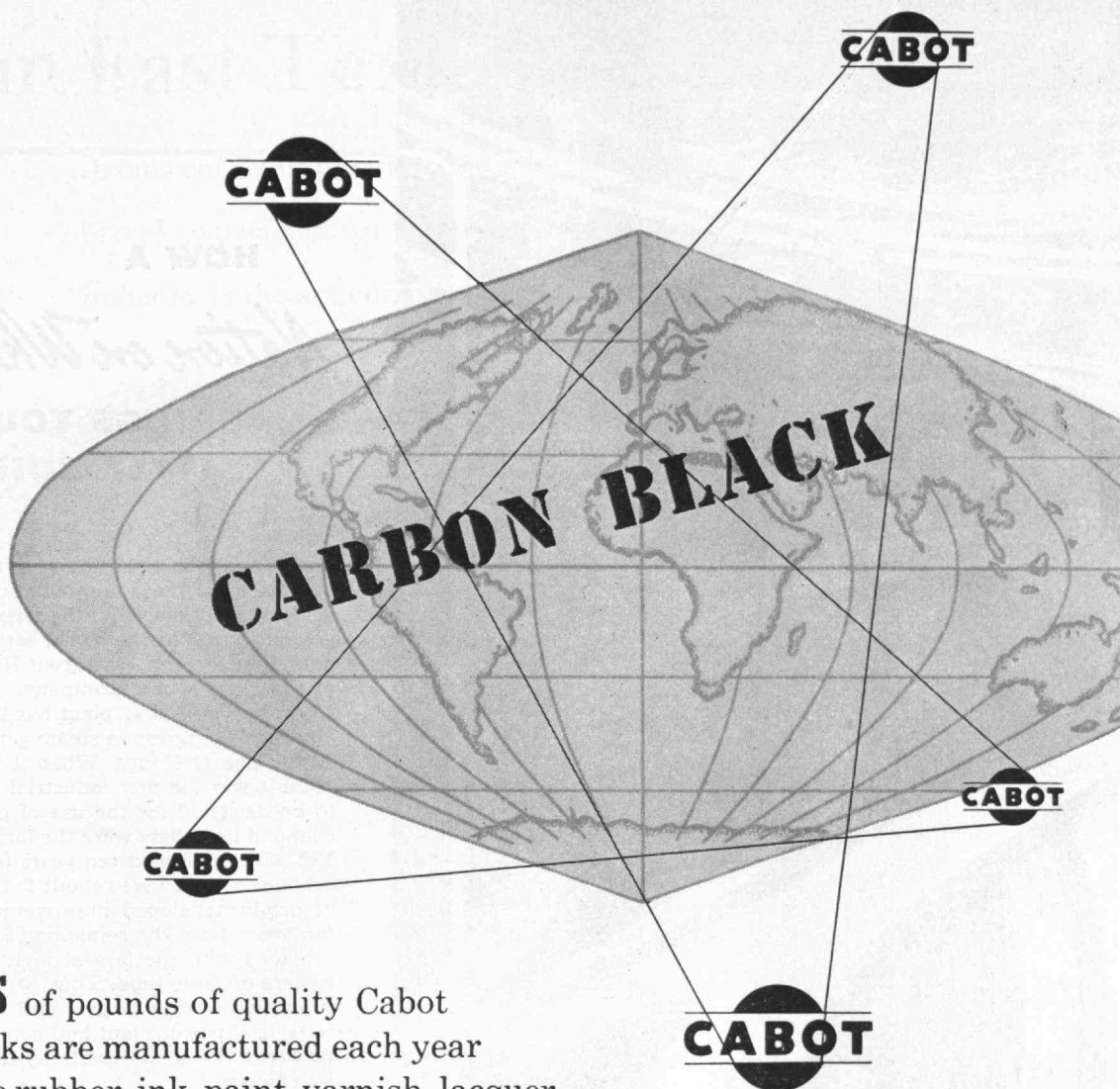
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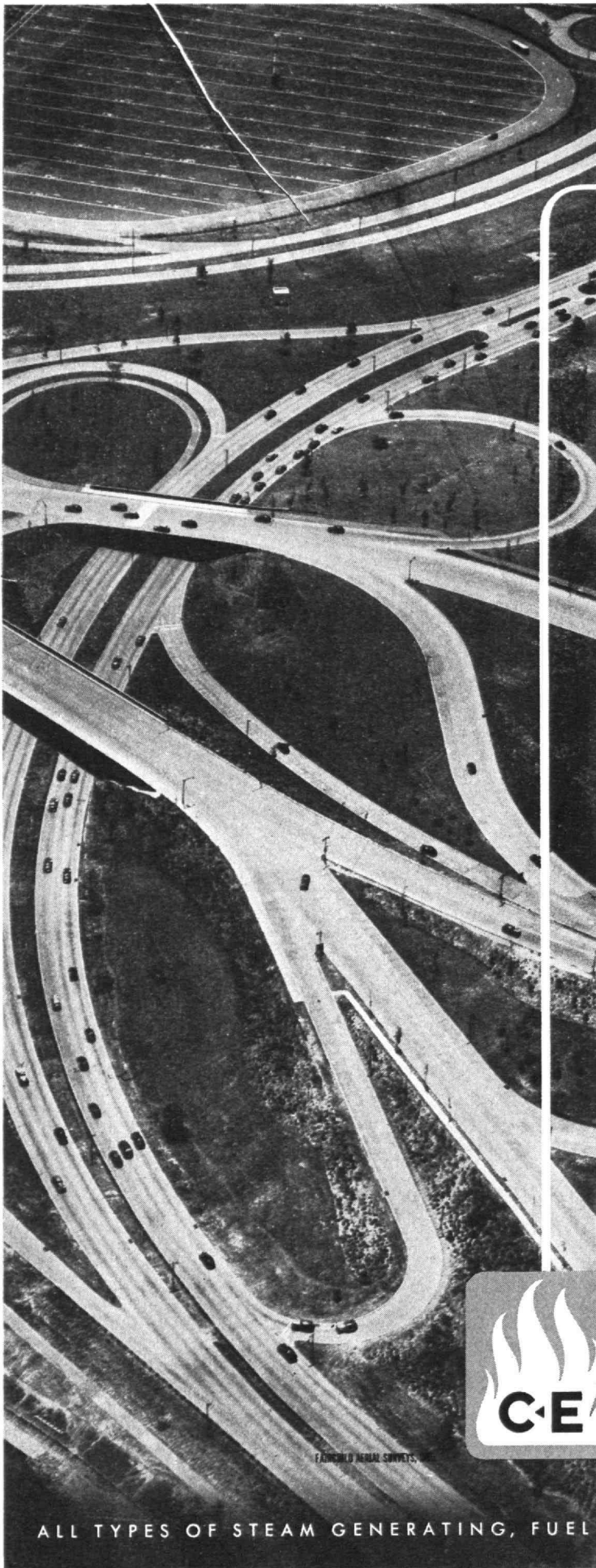
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B-421



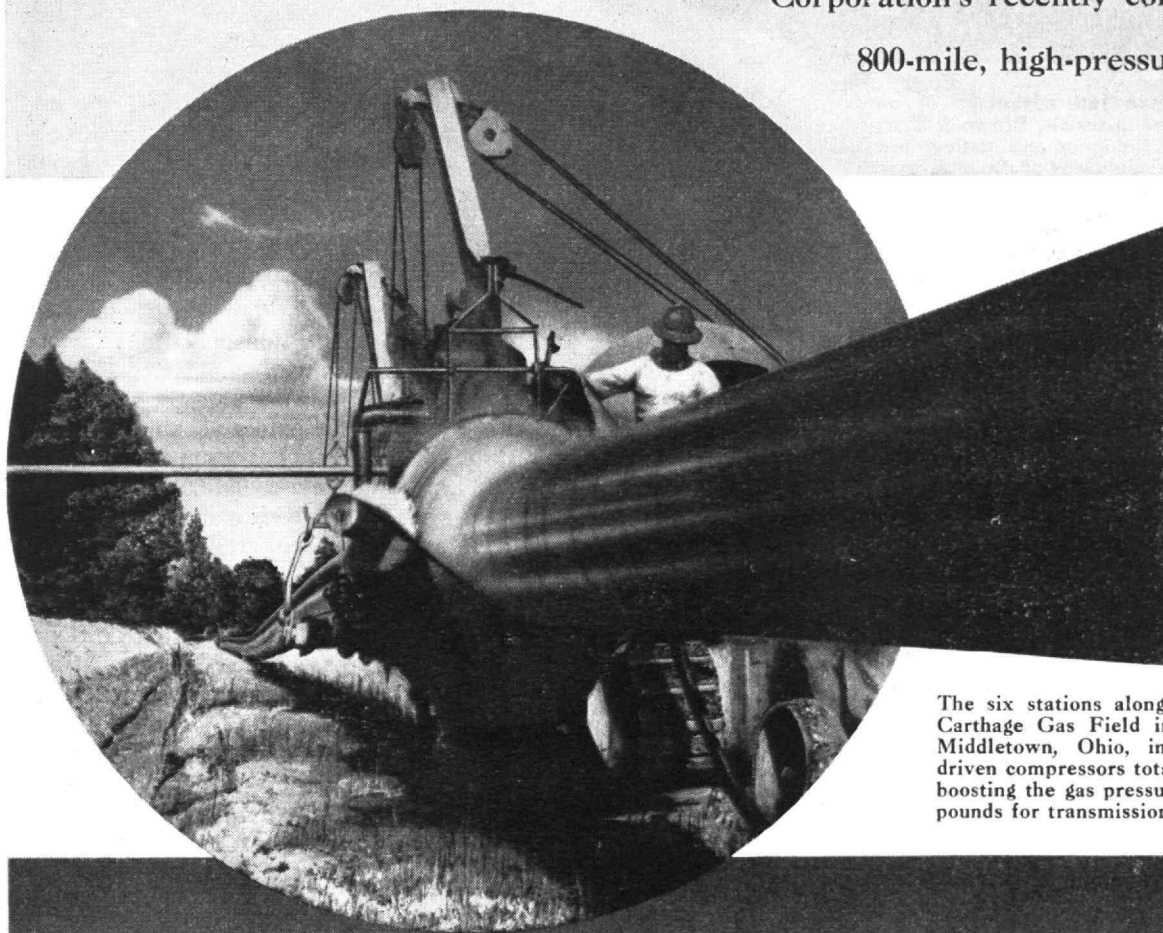
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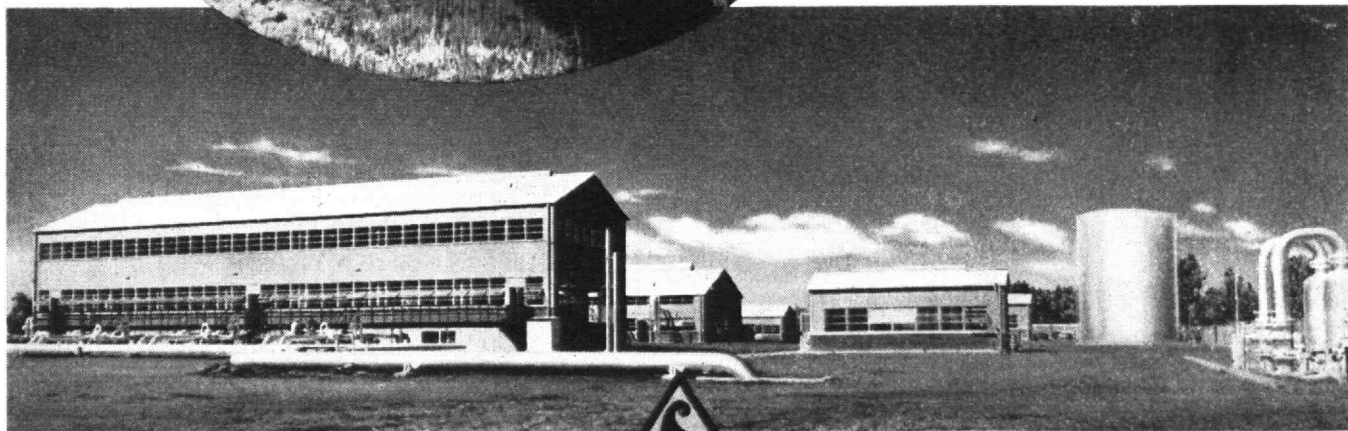
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## THE TABULAR VIEW

**Smoke Hole.**—This month marks the centennial of the first construction of the Hoosac Tunnel which our grandfathers planned in order to bring the industrialized northeast section of the country into commercial contact with the rapidly growing West. The drilling of the tunnel, through five miles of rock, presented an unusual challenge to engineers of the middle Nineteenth Century, but out of the 25 years of construction effort, there emerged newer and safer engineering practices of great importance. The saga of this engineering feat is ably recorded (page 141) for The Review by E. H. CAMERON, '13, whose articles on the historical aspects of engineering ventures have become well known to Review readers during the past five years. Mr. Cameron is head of the Technical Publications Division of Jackson and Moreland, well-known Boston firm of consulting engineers. Mr. Cameron's professional activities have been entirely in the field of civil engineering, and embrace projects in New England, the Middle West, and Southwest. They include the design of bridge construction details, and engineering supervision of various factory enterprises, flood-protection work, and steam systems.

**Ship Hulls.**—The fundamental unchangeability of ship hulls throughout the ages is emphasized (page 147) by WILLY LEY, editorial associate of The Review since 1944, and writer on a wide variety of technological topics. Mr. Ley's present study surveys a few unusual designs which have aimed to increase some desirable property of ships—usually their stability—and shows that radical departures from traditional ship shape have usually been found lacking. At any rate, there appear to be few cases on record where drastic modifications of hull design found use over an extended time. Mr. Ley has been engaged in several years of research activity at the Washington Institute of Technology during World War II, but his primary interest is interpreting science through his writings.

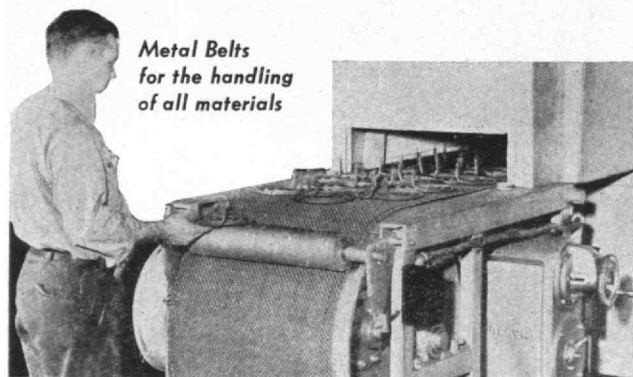
**Society's Headaches.**—The accelerated pace at which technological progress alters our way of living is discussed (page 150) by PAUL MEADOWS, Associate Professor of Sociology at the University of Nebraska, and during the past several years a frequent contributor to The Review on the social aspects of technology. Professor Meadows shows the interrelationships between invention and society's need to adapt itself to the changed conditions which important discoveries bring about. It is not the technological change which causes society's headaches so much as the rate at which invention proceeds that makes it difficult for society to alter its thinking and mode of life with sufficient rapidity to keep up with technological advance. Professor Meadows was a research associate in a Rockefeller Foundation research project in the humanities. He received his doctorate from Northwestern University in 1940, and since then has been teaching sociology, with a major interest in the human aspects of modern industrialism.

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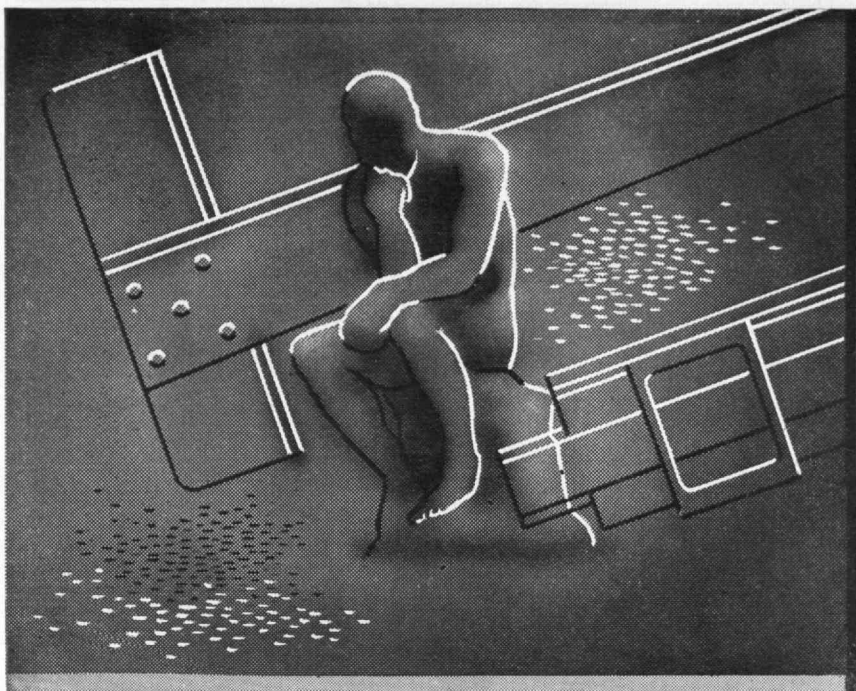


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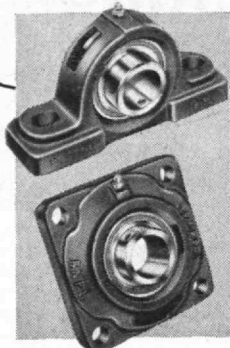
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## MAIL RETURNS

### Covered Bridges

FROM GEORGE H. BURT, '20:

I was interested in reading the article in *The Review* (December, 1950, page 83) in regard to covered bridges in New England, most of which seem to have been built 100 to 125 years ago. After I left Boston last June, I drove up through Maine, northern New Hampshire, and Vermont and happened to cross several covered bridges.

During my childhood here in the Middle West I had occasion to see several of the old-time covered bridges here which long since are gone, and I remember the story told to me at the time — that the reason for enclosing the bridges was primarily to prevent exposure to attack by Indians, rather than to give protection against weather, or to provide an enclosure for town meetings, as suggested in *The Review* article.

Since June I have tried to verify this history of the reason for the covered bridge and have been unable to find any explanation of the "why" of the covered bridge.

My observations last summer confirmed my previous recollections that the covering contributes no structural strength. The explanation given in *The Review*, that it offered a place for town meetings, as well as a convenient polling mechanism, would not seem to justify the use of the additional building lumber required; nor does it seem reasonable that in 1835 the populous was so poorly clothed or that the exposure to the elements in crossing an open bridge, as compared to the wooded areas on either side, would be such a hardship as to invite any consideration of the additional cost of such a structure.

The question has aroused my curiosity, and perhaps I may be able to arouse yours to the same extent so that you can find the answer and advise me.  
*Flossmoor, Ill.*

*[Although the old covered bridges present a certain picturesqueness for today's generation, it may be that that quality was founded on practicability. There must have been good reason for adopting a style so uniform in the numerous covered bridges, and the one that the editor has heard most often is that these hooded coverings provided good protection for the flooring of the structure against the elements. — Ed.]*

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# THE TECHNOLOGY REVIEW

TITLE REGISTERED, U. S. PATENT OFFICE

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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*Sanders from Black Star*

### *Waterfalls of Light at Grand Central*

# THE TECHNOLOGY REVIEW

Vol. 53, No. 3



January, 1951

## The Trend of Affairs

### *Engineers and National Defense*

**M**ARKING the opening of the second half of the Twentieth Century, the year 1951 brings less prospect for happiness and prosperity than other new years of the past. Since the end of June, troops of members of the United Nations have been engaged in a shooting war in Asia. The state of national emergency, which has been proclaimed for the United States, emphasizes the need to utilize to the fullest all of our resources for national defense. The pattern is reminiscent of a decade back.

Very much against its choice, the nation is once more forced to go on a war footing for the third time in a generation, and heavy demands will be made on our man-power resources. All activities will feel the pinch, but the demand for man power will probably fall heaviest on scientists, engineers, and medical personnel. The advanced technological state of our industrial society requires a minimum of 20,000 engineering graduates annually for normal peacetime operations, to which must be added whatever numbers are required for civilian defense and the needs of the armed forces. Under the past "cold war" circumstances, 30,000 graduate engineers each year was a conservative minimum estimate of this nation's requirements, and the figure will certainly advance sharply as our defense needs mount.

Recognizing these facts, real concern can be expressed at the drop in enrollment in this country's engineering schools which has already taken place. But a survey recently conducted by the American Society for Engineering Education, under the direction of Solomon C. Hollister, Dean, college of engineering at Cornell University, indicates that the trend is toward a further decrease of enrollment in engineering schools for the next few years. Although administrators of engineering schools have been concerned about the decrease in engineering enrollment since the spring of 1950, the critical state of engineering educa-

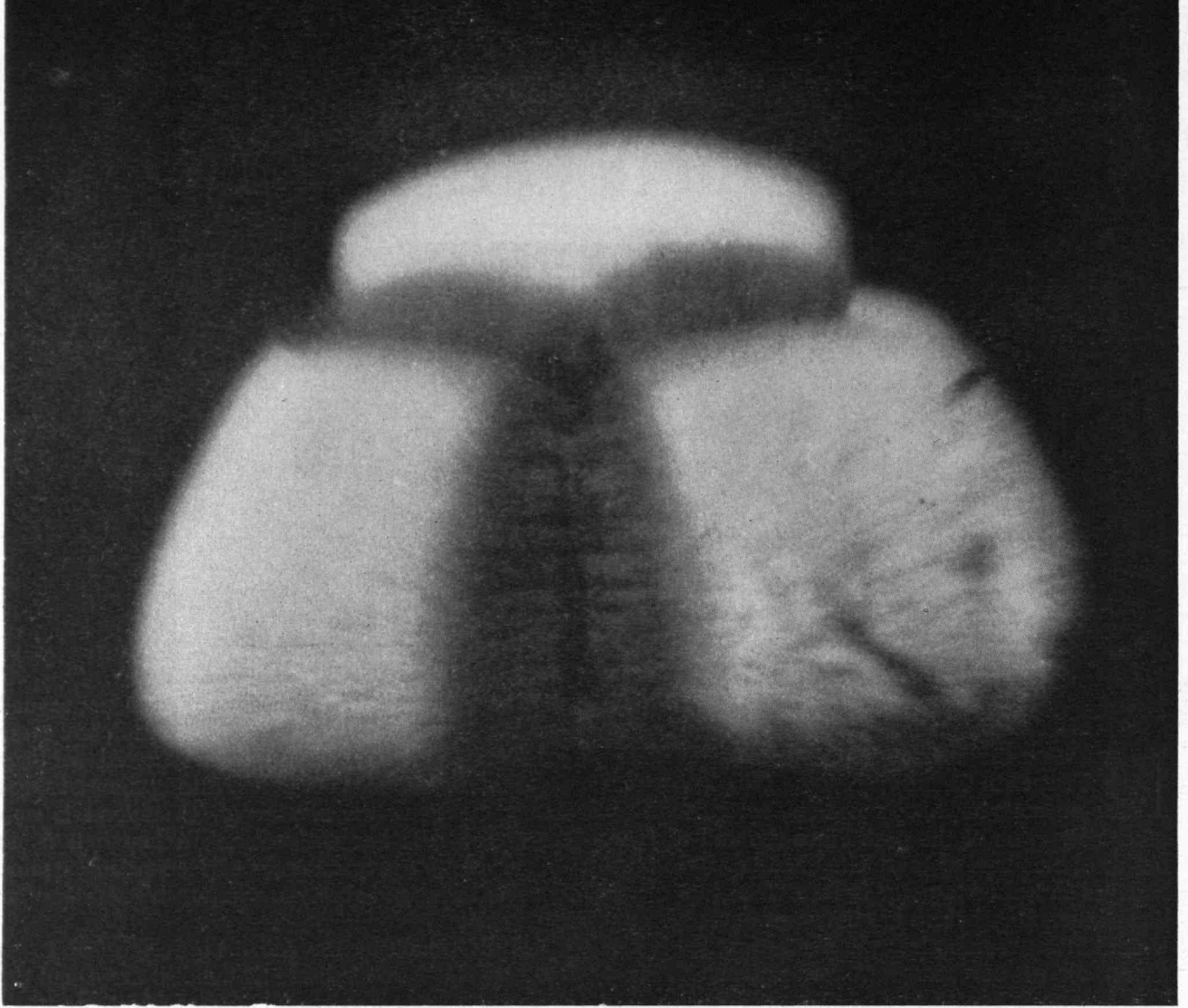
tion became evident last fall when enrollment dropped about 25 per cent from the preceding year, and some of the large engineering institutions reported that their enrollment had been cut in half during the past three years. So far as the number of its students is concerned, M.I.T. has not suffered, although it is no longer possible to make student selections on the same level of talent and ability as was possible shortly after World War II.

Studies made by the American Society for Engineering Education indicate that, unless the size of the entering classes is increased appreciably, the present enrollment of 130,000 students is likely to drop to about 105,000 in 1951, with a further reduction to 90,000 in 1952. Likewise, the survey indicates that, although 30,000 men will obtain engineering degrees in June, 1951, the number of graduate engineers is likely to drop to 21,900 in 1952, 17,000 in 1953, and 12,400 in 1954. Made last fall, these estimates do not take account of students who leave college because of the comparatively modest selective service requirements then in force. If these are taken into account, it appears that, at best, we cannot count on more than 18,000 engineering graduates in 1952, 14,000 in 1953, or 9,000 in 1954. This number of engineers will not meet our present normal civilian needs, let alone the stepped-up requirements imposed by civilian defense and the armed services.

During World War II, deferments were not made for competent students to carry on a normal course of study in science and engineering; instead we embarked on a program of accelerated training, and lived off our stock pile of scientific knowledge. Such a program was inimical to the best long-term interests of the nation.

All present indications are that the safety of the nation — now, and in the future — will require at least 30,000 engineering graduates each year. We are not now meeting that need, and the present trend is in the wrong direction.

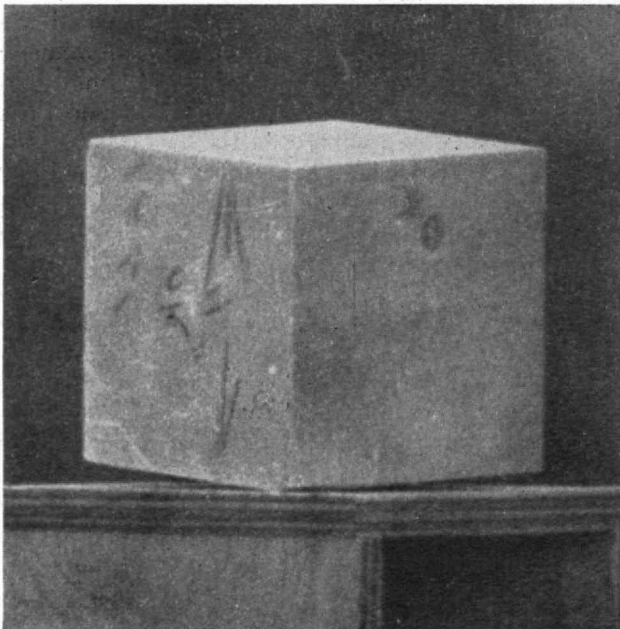




Photos by Harold E. Edgerton, '27

(Above): Explosion of a four-inch cube of high explosive taken with a four-microsecond exposure. A shutter delay of 13 microseconds was introduced after light was first picked up by a phototube. The dark areas correspond to the edges of the cube.

(Below): Photograph of the cube before detonation. The scale of the two pictures is the same.



## Microsecond Photography

A CAMERA shutter without moving mechanical parts, and which makes possible exposure in the region of from four to 10 microseconds, is one of the latest products of research developed by members of the Institute's group of scientists and research workers. Developed by a research team which includes Professor Harold E. Edgerton, '27, of the Department of Electrical Engineering, and Kenneth J. Germeshausen, '31, and Herbert E. Grier, '33, research associates of the Department, the new shutter has many interesting possibilities for industrial research by photographic methods. It is especially well suited to the study of explosions and luminous discharges, but is not limited to such applications. Except that it is considerably thicker than conventional shutters, and therefore requires somewhat greater space back of the lens, the magneto-optic shutter can be used with any conventional type of camera and lens system to provide good definition throughout a viewing angle of about 30 degrees or more.

Key element in the new camera design is the magneto-optic shutter which, because it has no moving mechanical parts, makes possible satisfactory exposures as short as a few microseconds. The shutter makes use of an effect, discovered by Michael Faraday in 1845, by which transparent bodies in a mag-

netic field rotate the plane of polarization of light passing through them.

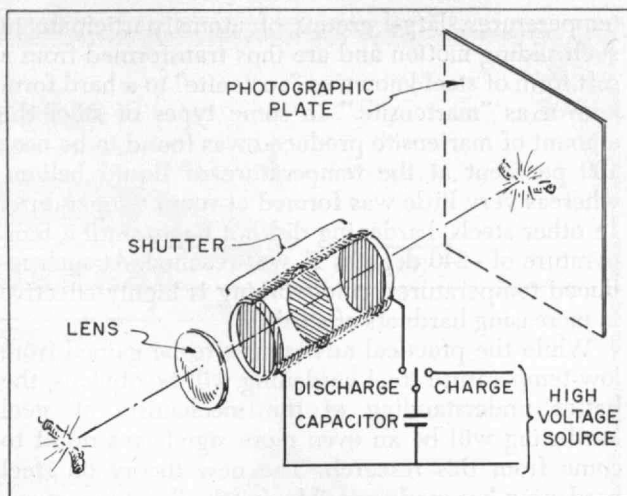
Essentially, the shutter consists of three sheets of polarizing material, the plane of polarization of the center being at right angles to the planes of the end elements. These polarizing plates are cemented between thick discs of strain-free, extra-dense, flint glass. Filters at the ends of the shutter restrict light passing through the shutter to a narrow band in the visible spectrum. Surrounding the shutter, which is made up as a cylindrical sandwich, is a coil of wire into which a pulse of current may be discharged from a condenser which has been previously charged to several thousand volts.

Under ordinary circumstances, the shutter is extremely opaque, passing something like one one-billionth of the light incident on its optical axis. Such high optical density is essential when recording photographically the action taking place in self-luminous bodies. When a condenser, charged to a potential of several thousand volts, is suddenly discharged through the coil surrounding the shutter, the current through the coils establishes a magnetic field of high intensity. The resultant magnetic field produces a rotation of the plane of polarization of light passing in the strain-free flint glass discs so that, during the passage of the current, the shutter becomes relatively transparent and passes about 4 per cent of the incident light, or about 30 million times the amount transmitted with the shutter closed.

A diagram of the functional elements of the shutter and camera system is shown in the sketch at the right. The lens system is adjusted so that an image of the object will come to focus on the photosensitive film. Normally, no light passes through the shutter because the plane of polarization of two of the polarizing elements is at right angles to that of the third. The capacitor is charged by throwing the switch to the right, or charge position; and, when the exposure is to be made, the switch is thrown to the left and discharges through the coil surrounding the shutter. During this discharge, the plane of polarization of the light in the flint discs is partially rotated to allow an image of the subject to appear on the photographic plate or film.

As is well known, when a charged condenser discharges through an inductance in a low-resistance circuit, the discharge current is not a single pulse, as would be most useful for the present application. Instead, an oscillatory current occurs which tends to "open" the shutter on successive alternations of the current flow. Although less light is passed through each successive opening, several exposures may be encountered unless precautions are taken to eliminate such multiple exposure effects. Single pulse operation may be attained by increasing the circuit resistance or by providing a spark gap to damp the discharge.

The condenser for storing energy and the coil surrounding the magneto-optic shutter are designed so as to provide the optimum time for shutter opening, usually between four and 10 microseconds. With an optimum exposure time chosen, it is possible to vary the net exposure by changing the voltage to which the condenser is charged. This alters the intensity of the magnetic field through the coil which, in turn,



Diagrammatic sketch of the functional elements of the high-speed shutter making use of Faraday's magneto-optic effect.

controls the degree of rotation of the polarized light through the shutter to determine the final amount of light recorded on the film. Voltages of the order of 8,000 volts are used to charge the condenser for existing shutters. Shorter exposure times are possible with higher voltages.

In ordnance use, the camera is set up with a photo-tube timing circuit so arranged that light from the explosion triggers the electronic control equipment, producing an accurately timed pulse which actuates the shutter. Photographs are usually made of the luminous discharge of the exploding material, although supplementary flash illumination may be used during the short interval for which the shutter is open. An advantage of the shutter is that light from the explosion may be excluded and the shock waves recorded by silhouette techniques. In either case, electrical circuits can be arranged so that small time delays may be introduced into the shutter circuit, making it possible to have the shutter open for any desired portion of the flash. The possibility of making either normal or silhouette photographs of intensely bright flashes greatly expands the capabilities of the photographic technique for industry.

## Mechanism of Steel Hardening

NEW light on the mechanism by which steel may be hardened comes from recent studies conducted in the Department of Metallurgy. Research conducted under the direction of Professor Morris Cohen, '33, of the Department of Metallurgy, has demonstrated that, in the process which makes steel hard, the atoms of steel can take up new positions even at the extremely low temperatures of liquid helium, -453 degrees F., and the steel, therefore, does not necessarily require sudden quenching at elevated temperatures as has been the practice in the past.

By showing the possible role of extreme cold in the hardening of steel, the Technology studies indicate that steel hardening may take place more completely at low temperatures than at any other. Steel hardening is described as a co-operative, shearlike sliding of many atoms moving in unison, rather than a result of individual movements of the atoms. At extremely low



temperatures, large groups of atoms participate in such sliding motion and are thus transformed from a soft form of steel known as "austenite" to a hard form known as "martensite." In some types of steel the amount of martensite produced was found to be near 100 per cent at the temperature of liquid helium, whereas very little was formed at room temperature. In other steels, hardening did not begin until a temperature of -240 degrees F. was reached. At such reduced temperatures, cold-working is highly effective in increasing hardness of steel.

While the practical advantages to be gained from low-temperature steel hardening will be obvious, the better understanding of the mechanism of steel hardening will be an even more significant result to come from this research. The new theory on steel hardening has made possible, for the first time, quantitative predictions of the behavior of steel treated in specific processes. This, in turn, promises that a more scientific approach may replace "cut and try" methods in future improvements of processing.

In these studies, Benjamin L. Averbach, '47, Assistant Professor of Metallurgy, and Saul A. Kulin, '49, research assistant, have been associated with Professor Cohen. The work has been made possible by the availability of large amounts of liquid helium which stems from the pioneering low-temperature research done a few years ago by Professor Samuel C. Collins of the Department of Mechanical Engineering — research which led to the development of the helium cryostat. The project, which has been sponsored by the Office of Naval Research with the aid of several steelmaking firms, is a concrete example of the co-operation which brings together specialists in various fields of learning for a common attack on scientific and technical problems encountered in research.

### ***Inside Information***

NOW nearing completion at the Institute is a linear accelerator capable of producing extremely intense x-rays and abundant neutrons, both of which are highly useful for obtaining inside information of the nuclear structure of the atom. Radiation equivalent to that produced by a kilogram of radium can be produced when the machine operates at full power. Like other machines of its type, the linear particle accelerator will be used primarily to yield experimental data which serve to verify or disprove present hypotheses regarding the ultimate structure of matter.

Like the cyclotron and the synchrotron (already in operation at the Institute), and the 12-million-electron-volt Van de Graaff generator (now nearing completion), the linear accelerator is one type of a sizable group of devices for imparting high energy to subatomic particles. It is, in fact, a device for speeding up electrons in a beam to a very high energy, and for producing an intense source of radiation when the electron beam strikes its target. Like these machines, it has its own peculiar advantages and disadvantages. Unlike the Van de Graaff generator, for example, the energy of the electrons accelerated by it is not uniform but spread out over an appreciable range. On the other hand, it requires, by its very design, power sources which are operated only at moderate voltages,

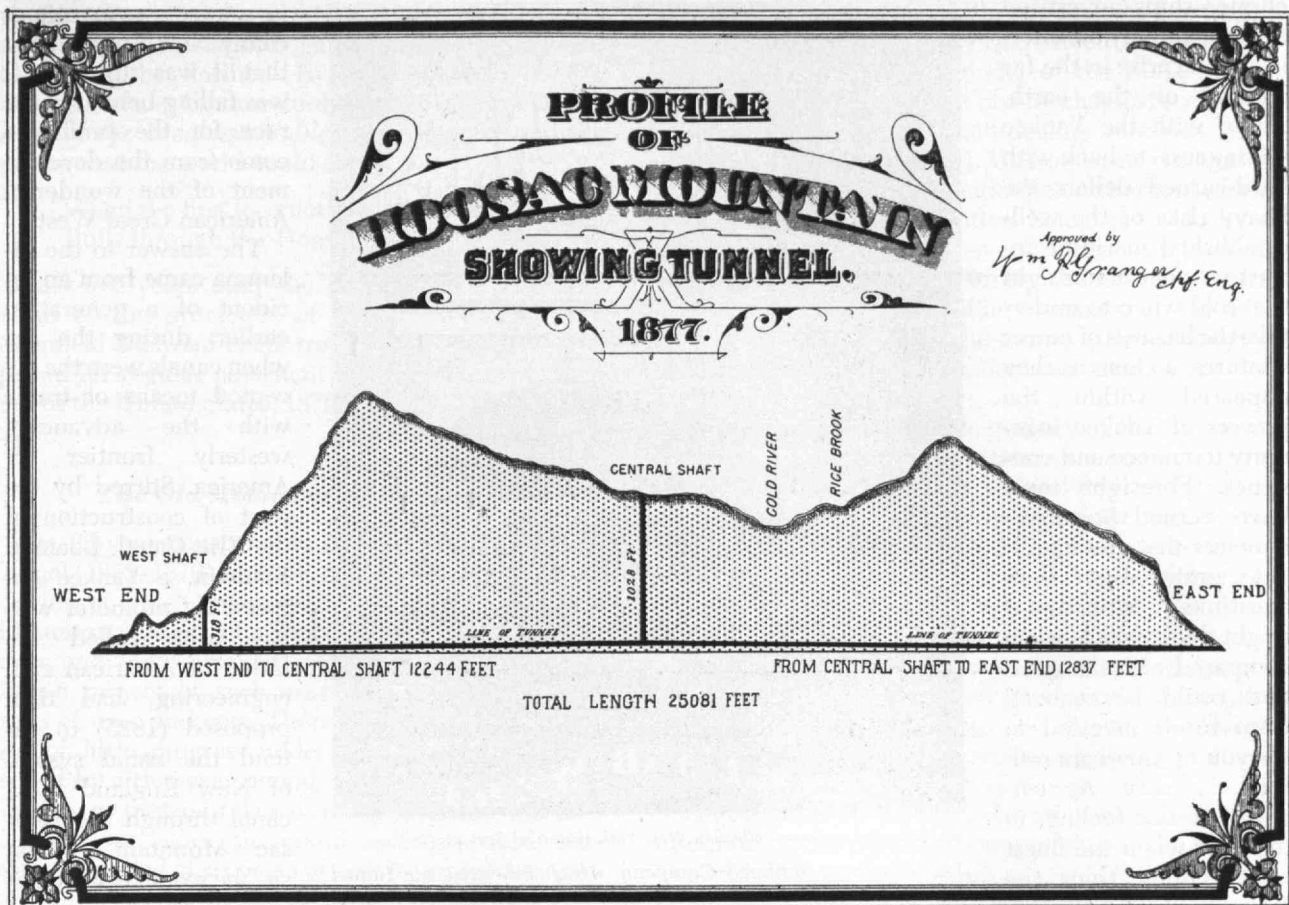
thus avoiding the insulation problems of the Van de Graaff generator. While its energy, about 17 million volts, is much lower than that of the synchrotron and no greater than many betatrons now in use, its high-beam intensity should make it suitable for experiments which could not be done with other machines.

The M.I.T. linear accelerator speeds electrons to a very high energy by letting them interact with an extremely high-frequency electric field. In a specially designed cylindrical pipe, or wave guide, properly separated into a succession of cavities, electromagnetic waves are set up, similar to those used in radar. These waves travel with the velocity of light, and if electrons of nearly the same velocity are injected into the wave guide, they travel down the accelerator in phase with the wave. In so doing, they acquire energy from the wave much as a surf rider acquires energy by "skiing" along the leading edge of a water wave.

Prior to their introduction into the wave guide, the electrons are speeded up to 97 per cent of the velocity of light by high voltage produced by a Van de Graaff electrostatic generator. Further energy is imparted to the electrons by the electromagnetic wave produced in the wave guide by 21 magnetrons of the type used to produce radar signals. One of the difficult technical problems of the design of the accelerator was to get all tubes operating in perfect synchronism, a feat which had not previously been attempted. The magnetrons produce 120 pulses of energy per second, each having a duration of about a millionth of a second. During the short periods of operation, the power of output of the magnetron is more than 5,000 kilowatts. The pulses are so short, however, and the periods between pulses comparatively so long, that the average power is in the neighborhood of about five kilowatts.

So far, it has been necessary to operate the accelerator at less than its maximum power output because of the large amount of radiation which is produced. The recent completion of a concrete room with floor, walls, and ceiling three feet thick should provide adequate shielding and reduce radiation to the point where safe operation can be achieved with full beam current. Tests are now being conducted to check the effectiveness of the shielding, and to bring the accelerator gradually up to its full rated beam current.

Construction of the M.I.T. linear accelerator was started soon after World War II, under the auspices of the Research Laboratory of Electronics, under the general supervision of Professor John C. Slater, Head of the Department of Physics. The first two or three years were spent on research and design, and the actual construction has taken several years. The accelerator is now practically ready for use on nuclear experiments, and for this reason it has now been taken over by the Laboratory for Nuclear Science and Engineering. Peter T. Demos, '49, research associate in the Physics Department, is now concerned with its development, and it will be used for nuclear research by him, Isaac Halpern, '48, of the Division of Industrial Cooperation, and several other members of the Nuclear Science Laboratory. Construction has been carried on by funds furnished the two laboratories by the Office of Naval Research, the Signal Corps, the Air Materiel Command, and the Atomic Energy Commission.



Courtesy of Boston and Maine Railroad

The above illustration has been adapted from a poster of 1877. The horizontal scale is about 4,200 feet per inch; vertical scale, about 1,300 feet per inch.

# The Blasted Bore

*Under Construction for Two and One-Half Decades,  
the Hoosac Tunnel Now Celebrates Its Centennial*

By E. H. CAMERON

ONE hundred years ago, at the time of the Boston Railroad Jubilee in 1851, the region of New England was said to have "no natural production for export but granite and ice." In other words, it was poor in natural resources and had to live largely by its wits to keep up with the sections of the United States to which Mother Nature had been more kind with her endowments. The Yankee formula, which had already been developed to meet this situation, is simple: The method has worked for generations as the recurring threats to New England prosperity have been met. First, the hard facts of the existing crisis are studied. Next, the future is viewed through the dark glasses of a deep pessimism which is merely to put the fear of God into the hearts of the threatened ones; for hard facts require hard thinking to devise means to overcome the obstacles in the path of New England well-being. In the final step, Yankee ingenuity and audacity join to point a way out, and it is a foregone conclusion that courage and persistence will carry

out the program with success. An inspiring example of this fine spirit of Yankee determination lies in the story of the Hoosac Tunnel, which this month is celebrating the 100th anniversary of its inception.

On January 7, 1851, the directors of an ambitious engineering venture voted to break ground the next day on a railroad that was to connect Troy, N.Y., and Greenfield, Mass. Their railroad would provide New England with an easy and direct connection with the lines leading toward the American Great West, with its promise of fabulous riches — precious ores, farm products, and timber. The success of this railroad would depend upon the driving of a tunnel through the talcose slate rock of the Hoosac Mountain, in the extreme northwesterly corner of Massachusetts. It would be several times longer than the longest tunnel in the world — nearly five miles long — and would be known as the Hoosac Tunnel.

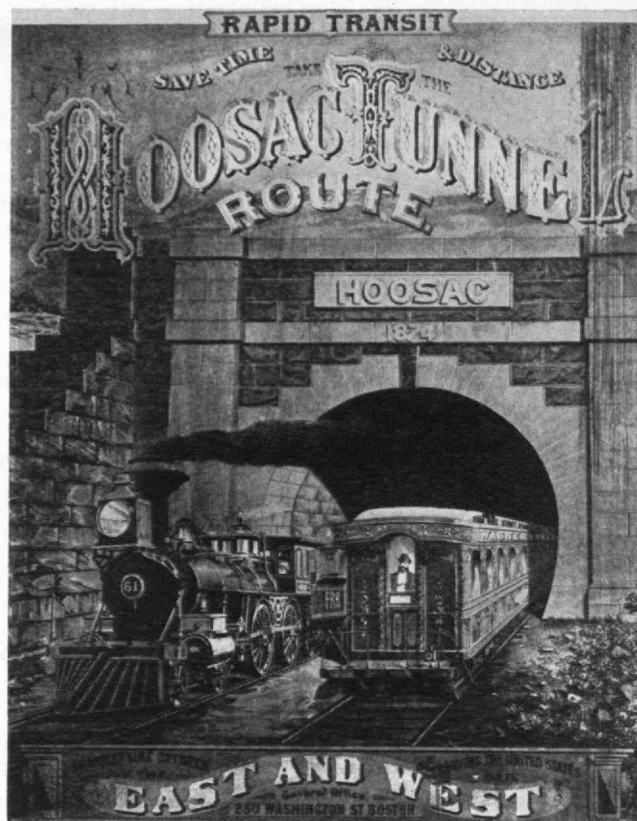
This bold move was made in the heyday of New England maritime prosperity, when its venturesome



clipper ships advertised the high quality of American enterprise in the far corners of the earth. Along with the Yankee willingness, to back with hard-earned dollars the heavy risks of the well-established maritime industry, went a foresight that told when to undertake the hazards of newer ventures, so long as they appeared within the powers of Yankee ingenuity to finance and construct. Foresight must have warned Boston financiers that the aggregate profits from their maritime investments might look small when compared with the gains that could be realized from funds invested in the young American railroad industry. As evidence of this feeling, in the year when the finest of the clipper ships, the *Flying Cloud*, was launched in Boston, there occurred both the start of the Troy and Greenfield Railroad and the celebration of the Great Boston Railroad Jubilee of 1851. At this brave festival, Daniel Webster and other statesmen, including the President of the United States, had extolled the impressive New England progress since the American railroad industry had started, two decades earlier. Further expansion of the railroad systems of New England was limited by a severe geological handicap.

The locomotive engines of 100 years ago were puny, and the Hoosac Range which blocked off the Massachusetts westerly boundary was high and steep.<sup>1</sup> The hard grades and sharp curves were a severe tax on the little Western Railroad (now the Boston and Albany) which was the only New England railroad to serve directly the region west of the Hudson River. The impoverished Western Railroad made a poor New England weapon in the battle of the easterly sections of America for the trade of the agriculturally rich Ohio country, and of the Great West beyond the Mississippi River. Already, the rivals of New England for this tempting trade had made effective moves toward securing it, via railroad lines which later became known as the Baltimore and Ohio, the New York Central, and the Pennsylvania. Of course, a heavy volume of freight was already being handled by the Erie Canal-Hudson River route. As has so often happened

<sup>1</sup> The larger locomotives of the day weighed only 30 tons, as compared with the modern "Big Boy" of the Union Pacific Railroad weighing 600 tons.



Mrs Bella C Landauer Collection, New York Historical Society

*The Fitchburg Railroad Company, which inherited the tunnel from the Troy and Greenfield Railroad in 1887, lost no time in exploiting the old claims of its merits as a route to the American Great West. The little boiler of the westbound locomotive seems designed to be merely a support on which to mount the huge smokestack (bellmouthed to catch sparks from the wood-burning firebox), the cowcatcher, and the headlight. The keystone date identifies this as the west portal. The east portal is dated 1877.*

Baldwin, through the Hoosac Mountain, the route of the Hoosac Tunnel was laid down. The petition for legislation for the first loan toward the construction of the railroad tunnel at this site<sup>2</sup> was based on Baldwin's old canal-tunnel estimate of cost.

In the long, seriocomic political controversy that went on during its construction, the Hoosac Tunnel became a joke, albeit a jest of macabre import when one considers its brutally high fatality record. Coincident with a progress that lists the loss of one human life for each 125 to 250 feet of tunnel, according to which record is accepted as correct, went a political battle that became a saga of political strife, for almost all of its cost had to be paid for by the State of Massachusetts. During this battle, the thrifty legislators on Beacon Hill had to decide whether those who called for more and still more tunnel funds were men of vision or were just visionary. In a series of bitter pamphlets, the tunnel was dubbed the "Great Bore" by a Massachusetts man, of a family that later begat a distinguished governor of the old Bay State. On the other side, substantial encouragement and strong support was given during the construction of the tunnel

<sup>2</sup> A featured advantage of the Troy and Greenfield Railroad over the Western Railroad was the fact that it would traverse a region of vast forests, with wood available at \$1.50 a cord, whereas the wood fuel supply for the locomotive engines of the Western Railroad was becoming exhausted, and cost \$5.00 to \$6.00 a cord.

in later generations, canny New England felt that it was slipping: It was falling behind in the race for the profits to come from the development of the wonderful American Great West.

The answer to the dilemma came from an incident of a generation earlier, during the era when canals were the accepted means of traffic with the advancing westerly frontier of America. Stirred by the start of construction of the Erie Canal, Loammi Baldwin, a Yankee engineering promoter who has been called the father of American civil engineering, had then proposed (1825) to extend the canal system of New England by a canal through the Hoosac Mountain. "Why, sir," he would exclaim, "it seems as if the finger of Providence had marked out this route from the East to the West." On the line of the never built canal tunnel of

by many a loyal New Englander.<sup>3</sup> As the years dragged on, friends and foes alike began to wonder if the tunnel ever would be finished. Even the cheerful Oliver Wendell Holmes became doubtful. Writing in *The Autocrat of the Breakfast Table*, Holmes expressed the opinion that the world could end:

“When the first locomotive’s wheel  
Rolls through the Hoosac Tunnel’s Bore.”

Twenty-five years after the start of the tunnel, the dream of the promoters of the ill-fated Troy and Greenfield Railroad came true, when the tunnel was opened for regular passenger traffic in the centennial year of the United States, 1876.

### ***The Old Methods (1851–1861)***

The 25-year construction program of the Hoosac Tunnel (1851–1876) logically divides into four periods, a review of which indicates the progress from the age-old mining methods of subterranean excavation to the faster and more efficient methods required to complete a project of such magnitude within practical limits of time and cost. There was thus a 10-year period of little progress under private contracts, succeeded by a two-year period, during which work was held up, as past mistakes were investigated and data collected on more successful methods used elsewhere. A period of six years of activity under state control followed, during which more effective methods were developed. The final period of seven years under a private contractor, using the improved methods, drove the remaining 63 per cent of the tunnel to success. Each period, either by its failures or successes, helped to develop practical methods of tunnel construction, which form the basis of those of today. Particularly, the modern construction and mining industries owe a great debt to those who built the tunnel, for their trial-and-error work in the use of compressed air and the blasting of rock by nitroglycerin, in the period when Alfred Nobel was developing dynamite — a safer form of this new and mysterious explosive.

In this first period of strong doubt whether the tunnel was feasible, scant records of experience existed for carrying on the various steps of a tunnel project of such magnitude: the drilling of the rock; the charging and detonation of the explosive to blast it away; the disposal of the spoil; ventilation; drainage; and illumination. The rock was removed at the start by one-jack and double-jack hand-drilling<sup>4</sup> of the holes in which the black gunpowder charges were inserted. The charges were set off by fuses, ignited by candles.

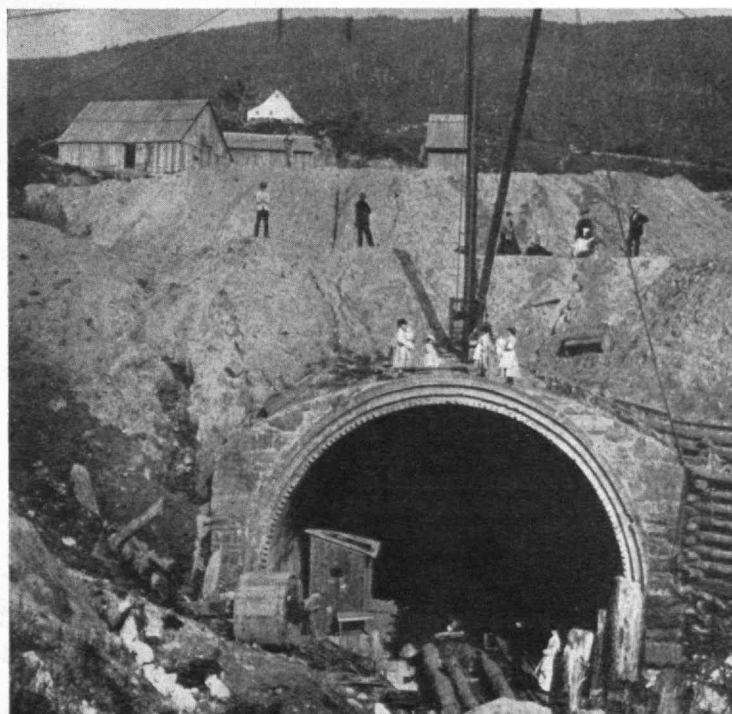
Years earlier, Isaac M. Singer, of sewing machine fame, had built several steam-operated, vertical rock drills which were used on the Illinois-Michigan Canal in 1838. Two years before the start of the tunnel

(1849), Joseph J. Couch, of Philadelphia, had patented a cumbersome percussion drill, driven by steam. In the very year of the beginning of the tunnel, what seems to be the basic patent of a mechanical rock drill, which should simulate hand-drilling methods most practically, was granted to J. W. Fowle, an assistant of Couch. Fowle’s machine made the cutting tool an extension of the piston, rotation being actuated by a ratchet-and-pawl device. Several other semipractical rock drills were patented during the next few years, while hand methods of drilling continued on the slaty rock and quartz seams of the tunnel. It would be several years before a truly practical mechanical rock drill was devised.

A fortunate feature of the geology of the site lay in the fact that the grade of track at the west end could be made the same as that of the east end; and that the Cold River Valley, near the center of the tunnel, was at a low enough elevation to allow the practical construction of a central shaft from the surface down to the tunnel. Two advantages went with these features: first, with the center of the tunnel established at a higher level than the ends, water which seeped through the seams of the rock strata could drain naturally to the east and west portals, avoiding high pumping charges; second, the tunnel could be worked from four headings instead of two.

Legislators who considered a state loan paid close attention to the report on the geology of the Hoosac Tunnel by Edward Hitchcock, who was state geologist of Massachusetts, and president of Amherst College — a man highly respected in Europe and in America for his scientific knowledge in the day when American science was in its infancy. He called the tunnel feasible to construct. Hitchcock’s prediction of rock conditions was verified by later geologists, who found a limestone formation near the west portal, changing

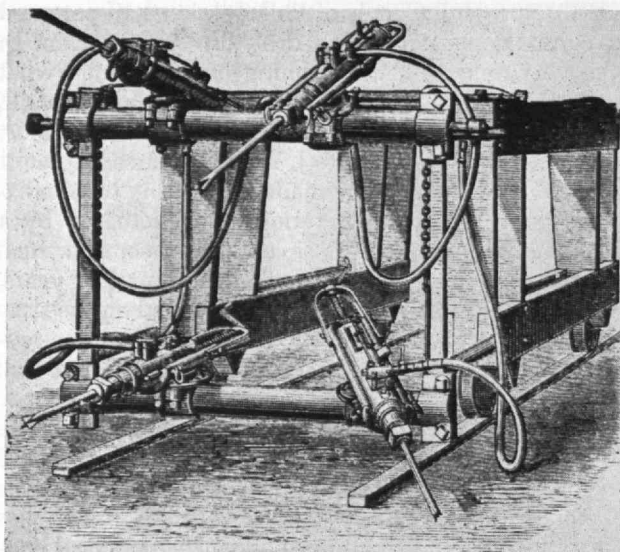
*This view at the west portal was taken when the heading had been advanced 4,500 feet. The westerly section of the tunnel proved most difficult, due to the soft rock and water condition encountered. Of the tunnel’s total length of 25,081 feet, 7,573 feet were brick, arched with six rings, as shown.*



<sup>3</sup> Most notably Otis Clapp, the pharmacist, one of the first members of the M.I.T. Corporation.

<sup>4</sup> “A double-hand hammer or ‘double-jack’ is gripped and swung with two hands. This type of drilling calls for two men, one to strike the drill steel and the other to hold it in the hole and to turn it after each blow. In single-hand drilling, one man both strikes and holds the steel.” — *Compressed Air Magazine*, January, 1938.





Scribner's Monthly, December, 1870

A contemporary Burleigh drill used on the Sutro Tunnel between 1874 and 1878 was described in *Compressed Air Magazine*, January, 1938, as follows: "This machine is 6 feet long, weighs 550 pounds, has a 14-inch stroke, and can drill a 1½ inch hole at the rate of 1.22 inches per minute when operated with air at 60 to 70 pounds pressure. The piston is 4½ inches in diameter. The complete piston assembly, including the chuck, weighs 125 pounds and reciprocates at the rate of 300 blows per minute."

in an easterly direction to mica, slate with quartz veins, and with much feldspar. A hard gneiss occurred near the center of the mountain, changing near the east portal to talcose slate. For the easterly portion of the tunnel, the dip of the rock strata was near enough the vertical to avoid the danger of falling rock; hence lining was unnecessary. The dip is quite flat in the westerly portion, requiring brick arching for about 7,600 feet of tunnel. Ground water leakage through the seams proved to be considerable, and the damp walls proved an ever present hazard to those who handled the crude electrical blasting apparatus.

Early in the program came the "boring machine" experiments. Unlike a rock drill, which drives holes to receive explosive charges, the boring machine was supposed to cut, by the impact of rotary cutters, a circular groove, 13 inches wide by 24 feet diameter. The rock within the groove was to be broken out—either by blasting or by wedges. This \$25,000 machine was unsuccessful and was abandoned. At this stage, spoil was removed by mule cars; drainage flowed via ditches to the portals. Lighting was by candles and open-flame oil lamps. There was little ventilation.

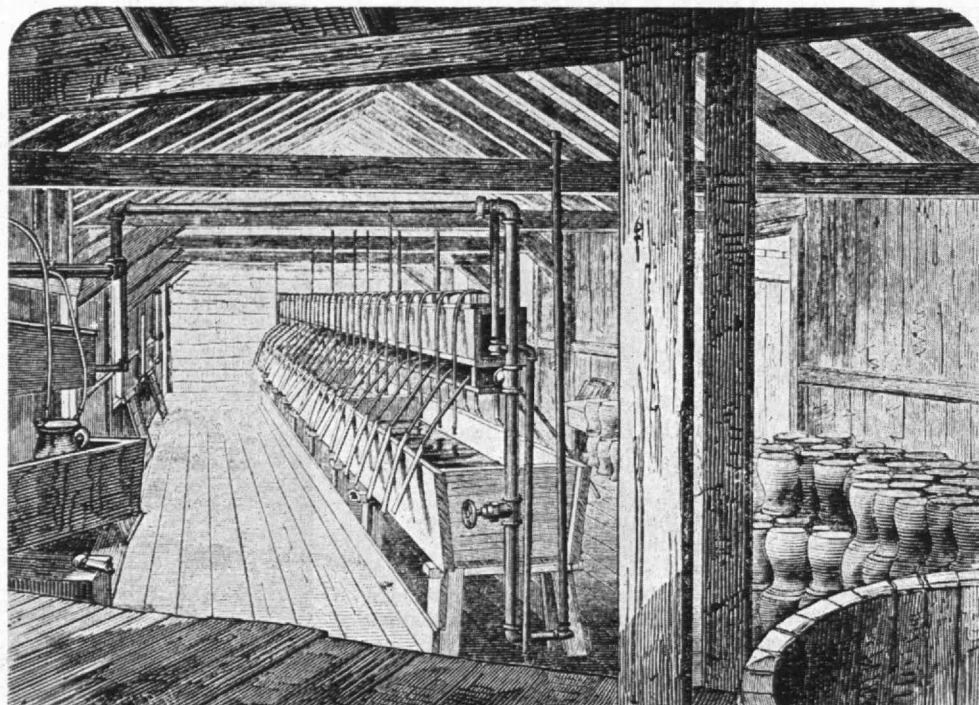
As evidence of how impracticable the tunnel was proving to be, the doubters pointed to the difficulties encountered. Their criticism focused on the record of the first contractor to make an organized start on the work: Herman Haupt, a graduate of West Point, with a previous wide experience in private railroad construction. In the voluminous files of the political history of the tunnel, Haupt's name appears most frequently. Thrown off the tunnel job in 1861, the year of the start of the Civil War, Haupt went back to the U.S. Army and was placed in charge of Construction and Transportation of U.S. Military Railroads. His subsequent record in one of General Grant's campaigns was so impressive that he was offered a commission of Brigadier General of U.S. Volunteers. Highly endorsed by reputable men, he was accused of unethical practices by men of equal note.<sup>5</sup> The facts of the case appear to be that he failed at the Hoosac Tunnel because of the limited knowledge of tunnel work in the earlier period of its construction and that other, perhaps more talented, engineers were able to take lessons from his failures and succeed with the successful methods at the Mont Cenis Tunnel in Europe.

Started in the year when *Uncle Tom's Cabin* first appeared in print,<sup>6</sup> this period of the tunnel construction

<sup>5</sup> A collector's item is Haupt's *General Theory of Bridge Construction* which was published in 1851.

<sup>6</sup> First published as a serial in *The National Era*, Washington, in 1851 and 1852.

The steadiest men were selected for work in the converting room, and each moved like clockwork. After the various operations were completed, the floors were swilled with water so as to keep them scrupulously clean of nitroglycerin, which when stepped on might explode violently. Despite all precautions, a magazine at the east portal blew up, killing the three miners who went that morning to prepare the nitroglycerin for the day's use. It was reasoned that a man had dropped a hot coal on the wood floor at the heater. These accidents occurred before the then novel method of steam heating was adopted.



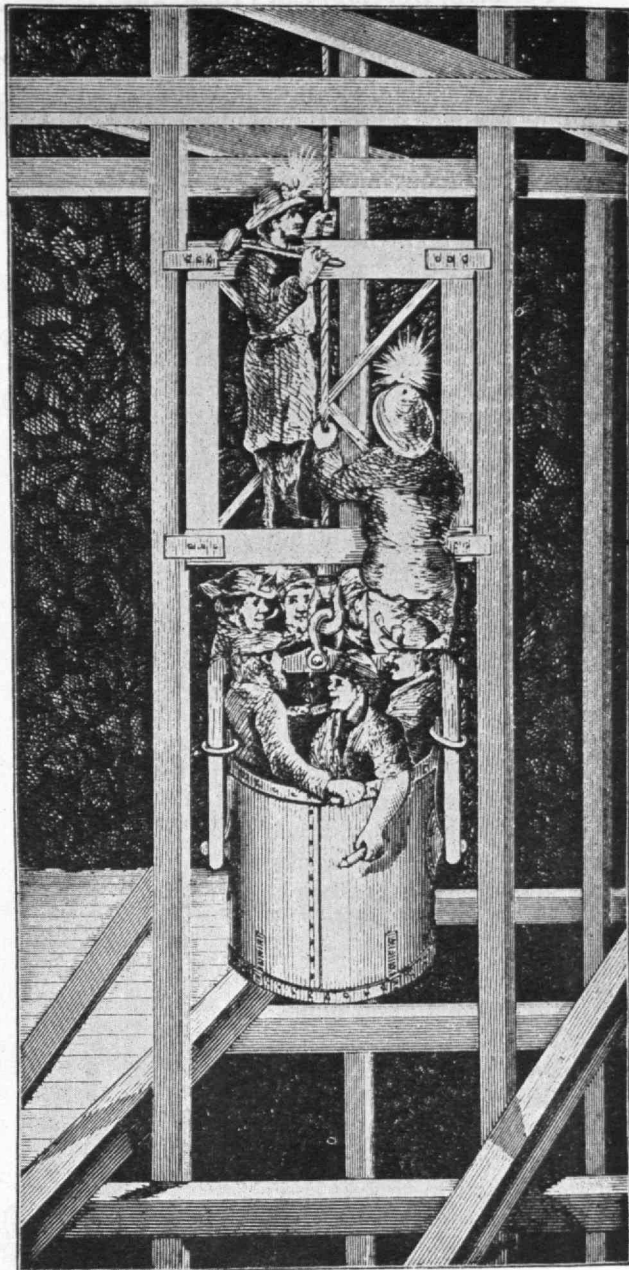
witnessed the increasing strength of the abolitionists, whom the famous novel on slavery inspired; continued through the presidencies of Fillmore, Pierce, and Buchanan during which the slavery controversy surged to its climax. Lincoln was elected President and the Civil War started with the firing on Fort Sumter. The tunnel could not be called a military necessity, as was the case with the Pacific railroads. Dissatisfaction with the methods of Haupt was so bitter, and the war needs were so great, that work on the tunnel was stopped in the year 1861.

### ***Period of Taking Stock (1861–1863)***

The young American railroad industry had now reached sturdy proportions. Throughout the East were many factories that made locomotives, cars, iron rails, and track fittings, and the total mileage of operated roads had increased threefold since the start of the tunnel (10,982 miles in 1851 to 31,286 miles in 1861). In its first campaign, the Republican party sponsored the construction of a railroad to the Pacific Coast, an inspiring bit of news to the proponents of the Hoosac Tunnel. As they considered the poor record of tunnel progress to date, they could see more promising developments in the search for practical mechanical drills and a more powerful explosive. They learned, however, that their tunnel could no longer be called the longest in the world.<sup>7</sup> Now under construction at Mont Cenis was a tunnel that would be nearly eight miles long, near the famous pass across the Franco-Italian Alps frontier, where the Emperor Napoleon had built a carriage road years earlier. (The Mont Cenis Tunnel was to be completed five years earlier than the Hoosac Tunnel.) At this tunnel, European engineers had found that air could be condensed and the compressed air transmitted long distances. Machines had been invented in which this compressed air, like steam, drove pistons to operate cutting tools, which drilled the holes for charges of gunpowder. The Hoosac Tunnel authorities sent competent Charles S. Storrow to investigate this successful use of compressed air on the Mont Cenis Tunnel, whose report is a fine model for modern engineers. James Laurie, the first President of the young American Society of Civil Engineers, was called in at this time for advice. Laurie compared the cost of shipments to the West via the tunnel with the costs via the several routes with which it would compete. He reviewed the Storrow report, and his conclusion stated that, of course, the tunnel was feasible to construct; but like any shrewd Scotchman, he told the Commission that it was up to them to decide if it would pay off. Another consulting engineer was called in at this period — Benjamin H. Latrobe,<sup>8</sup> chief engineer of the Baltimore and Ohio Railroad, who had extensive experience on the shorter tunnels of that railroad. The highlight of the Latrobe report was its statement of an obvious axiom of rock-tunnel procedure: "The boring machine which had

<sup>7</sup> Today, the Hoosac Tunnel is listed as the fourth longest tunnel in North America. See *Railroad Magazine*, June, 1946.

<sup>8</sup> Latrobe's father, Benjamin Henry Latrobe, "constructed the south wing of the Capitol (at Washington) . . . resigning his post as Architect of the Capitol in 1817." — *Washington Star*.



Tri-Nitro-Glycerin, 3d edition, 1874

*Unlike their European confreres who were constructing the Mont Cenis Tunnel under the lofty Alps, the builders of the Hoosac Tunnel found it practicable to excavate a shaft near the center, which allowed them to work four headings simultaneously. The 62 wooden floors of the 1,028-foot-deep shaft were connected by ladders, but the Irish and Cornish miners would, of course, ride the hoist; one is shown carrying a candle.*

been tried on the Hoosac Tunnel was an example of misdirected mechanical ingenuity," he said. "The explosive must do the work, not mechanical devices."

During a dark period of the Civil War, John A. Andrew, the famous war governor of Massachusetts, took time to review these reports. His message to the legislature said: "Considering the benefits . . . to . . . City and State, we are of the opinion that the work should be undertaken by the Commonwealth, and completed as early as it can be, with due regard to economy." This endorsement by Andrew saved the Hoosac Tunnel, but he did not live to see its completion.



### Period of Development (1863–1869)

The spirit of optimism following the Battle of Gettysburg in July, 1863, undoubtedly influenced the Massachusetts authorities in their decision that work should be resumed on the tunnel under the control of a State Commission (October, 1863). The war had caused a tremendous industrial expansion in the northern states which would continue, it was hoped, after the war should end. Ground had been broken on the westerly end of the Pacific Railroads at Sacramento, Calif., and in two months a start would be made on the easterly end at Omaha, Neb. It was important that New England should be ready, when peace came, to get its share of the trade with the Great West, via the Pacific Railroads. The completion of the Hoosac Tunnel seemed still more necessary, and trials must be made of the two powerful agencies which had been used elsewhere: compressed air with good success at the Mont Cenis Tunnel, and nitroglycerin for blasting, with promise of success, in certain European countries and in the oil fields of Pennsylvania.

In their enthusiastic review of the success of compressed air at Mont Cenis, both Laurie and Latrobe were confident that American ingenuity would produce still better methods. Soon this optimism was justified when Charles Burleigh of Fitchburg, Mass., with his two assistants, patented rock-drilling equipment which proved to be practical. Of the 40 Burleigh drills soon in use in the tunnel, it was said: "Mr. Burleigh's invention has several 'weakest spots,' and often breaks down but never wears out." Burleigh also built (1866) the first large air compressor of practical value to originate in the United States—several of these supplying compressed air at a pressure of six atmospheres, at the tunnel. A rock-filled, timber crib dam across the Deerfield River was built during this period to supply power to drive the compressors at the east portal. During the dry summer months here, and at the central shaft and west portal, steam-driven compressors were used.

The accuracy of the tunnel alignment and the ingenuity of the methods used were notable. The aboveground line was marked by four iron poles set in masonry: two on each mountain peak between the portals, and two (backsights) across the Deerfield and Hoosac rivers, respectively. From these exterior signal points, the interior tunnel lines from each portal toward the central shaft were laid down. At the central shaft, the exterior line was transferred to tunnel grade by two 15-pound plummets, 23 feet apart suspended in buckets of water by wires, 1,000 feet in

length. The scope of this article does not permit a description of the cleverly designed instruments invented for this procedure, or the numerous adjustments required under summer and winter conditions before an accurate line was located for driving the tunnel from the shaft toward the two portals. That this 23-foot-long line was accurate is attested by the fact that, when extended over 1,500 feet to the east, it missed the line of the east portal heading by only  $\frac{5}{16}$  of an inch. The deviation of the line, extending over 2,000 feet westerly, missed the line of the west portal heading by  $\frac{5}{16}$  of an inch.

Toward the end of this period, nitroglycerin was first used. As an expert in the use of this powerful explosive, George M. Mowbray,<sup>9</sup> "operative chemist," was called from the oil fields of Pennsylvania to the tunnel by Thomas Doane, chief engineer. The sinister reputation of nitroglycerin at this time is indicated by the following incidents in its pioneer transportation and handling.

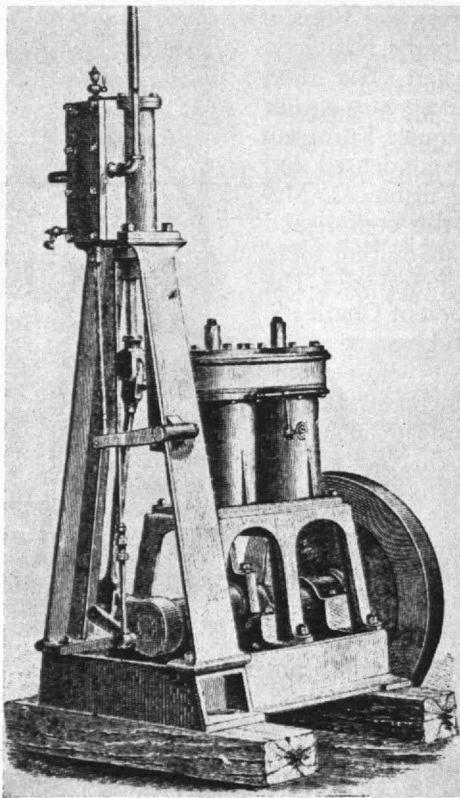
Tempted by the promise of quick profits, both in the gold mines of California and the oil fields of Pennsylvania, a European gentleman had brought to New York a sample of glonoin oil, a form of nitroglycerin, hoping to interest American promoters in its use. The shrewd clerk of his hotel on Greenwich Street had held the package of glonoin oil for security, when it became evident that his guest was unsuccessful in his efforts to interest American investors. When the pack-

age began to emit yellow fumes, the clerk rushed to the door and tossed it into the street. Although no one was killed in the ensuing explosion, all windows within a radius of 100 yards were shattered. Forty-seven people had been killed when a shipment of nitroglycerin in the iron steamship *European*, en route from Europe to San Francisco, had exploded at Aspinwall, now Colón, Panama. Eight persons had died in the explosion of a Wells Fargo Shipment of nitroglycerin from Hamburg, Germany. Nitroglycerin was in bad repute in America; Germany prohibited its use, and England allowed its use only after strict limitations.

The ensuing success of the tunnel experiments with nitroglycerin made its adoption attractive. All concerned realized that rigid precautions would be needed in its use if casualties were to be kept to a minimum. Mowbray was selected to devise, not only methods for its use, but for its manufacture on the site, for no common carrier would ac-

(Continued on page 160)

<sup>9</sup> In Pennsylvania, Mowbray had worked with Edwin L. Drake, who drove the first oil well near Titusville, Pa.



Scribner's Monthly, December, 1870

*This rare woodcut shows a steam-driven compressor, used at the west portal, central shaft, and the east portal when the river was too low to supply hydraulic power. It is not clear whether the compressor is two-stage, or if the two air cylinders operated at the same pressure. (Pressures were 90 pounds at the plant, and about 60 pounds at the drills.)*

# The Unchangeable Ship

*A Review of Several Unusual and Interesting Ship Designs*

*Reminds Us That the Basic Ship Shape Has Remained*

*Essentially Unchanged through the Ages*

By WILLY LEY

THERE have been many changes in ocean conveyances since Leif Ericson sailed to Vinland not quite a thousand years ago. His ship was made of wood; ours are of steel. The Vikings may have used thongs, dowels, or nails to hold their ships together; we use rivets and welding. They traveled under sail and with muscle power if the wind were wrong or lacking; we have steam turbines and Diesel engines. The Vikings froze in the open air; we have heated cabins. They were isolated when at sea; we have radio communication. We travel as great a distance per day as they did per week, provided they had favorable conditions. In regard to size, we should consider their ships a bit small for lifeboats. But with all these changes the basic shape of the ship remained the same.

This statement on basic ship design is not intended to refer to the fine points of hull shape and to such design problems as external or internal keel, flat or round bottom. Much of that is determined by the use to which the ship is to be put (passenger liner, vehicle ferry, freighter, combat vessel) or by the type (lake, river, or high seas) and to some extent also by the overall size. But it does have reference to the general shape; it refers to whether the bow is pointed or not, as well as the stern, and applies to ships whose ratio of length to beam (width) is 3.5 to 1 or more. The general "ship shape" has remained unchanged since it was first devised, and all attempts to do away with it have found an inglorious and usually very quiet end. A recounting of a number of attempts to introduce radical departures emphasizes this point.

Beginning with the most impractical idea of all, it may be reported that, about 1860, a number of men in England founded the Jointed Ship Company, Ltd. Positive that freight shipping by sea could profit from the example of the railroad train, the inventor for this company proposed to build a ship which was literally hinged together of independent units. The purpose was not so much to increase seaworthiness or speed or anything like that; the company merely wanted to produce a commercially superior type of freight vessel. Why should the whole ship be delayed in port if only one section were to be loaded or unloaded? Why not disconnect the whole section, proceed without it, and pick it up again later? The proposed jointed ship was actually built in 1863, and was christened the *Connector*. It consisted of three sections only: the bow section (of orthodox shape); the detachable center section (square at both ends); and the stern section

(also of orthodox shape). Each section had a lifeboat and a mast. The stern section also had a steam engine. Of course more than one center section was planned for later use. The first ship was merely to prove the superiority of the idea.

A trial trip was made on a day which happened to have fine weather. The disconnecting of the center section was demonstrated, and then a party of engineers and Navy officers were taken for a ride on the shortened ship and served dinner at sea. For reasons easy to imagine, contemporary comment seems to have consisted of vague generalities only. Any old salt, or any engineer, hearing the statement that neither a heavy sea nor even running aground would break the ship's back, must have asked himself about the pins which held the sections together. As far as one can gather, the *Connector* made a total of two trial runs. What happened to it afterwards is described nowhere. Presumably, the Jointed Ship Company, Inc. became disjointed quickly, and every investor decided that silence was at least face-saving, if not golden.

If the *Connector* were decidedly absurd, one could not be so sure from the outset about the next attempt to abandon the traditional and proven ship shape. The reasons for that next attempt were not commercial but military. Just a year earlier than the *Connector* episode, a strange-looking craft had been launched in America. This was Ericsson's *Monitor*—the famous ship being commonly described as a "Yankee cheese box on a raft." While the original *Monitor* did not actually sweep all Confederates from the seas by itself naval experts quickly saw that such monitors might be a useful addition to fighting fleets. Unfortunately, the single turret sometimes got stuck and might do so even more frequently because of enemy action. Then, too, the monitors were no steady gun platforms, but of course nothing else was either.

Vice-Admiral Popoff of the Imperial Russian Navy thought that he had the answer to both difficulties with which the *Monitor* was afflicted. His solution amounted to making the "cheese box" float by itself. He drew plans for a circular monitor with two heavy guns in the middle, two funnels flanking the guns, and a few small and low structures scattered around. There was even a small mast, presumably for flying the flag, for it could not have had any other use. Vice-Admiral Popoff's plans were approved by the Czar of All the Russians, the treasurer surrendered the necessary cash with a bare minimum of the usual com-



plaints, and two such vessels were built — one in 1873, the other in 1875. The first was called the *Novgorod*; the second bore the inventor's name. The Russians called these vessels "popoffkas." The two popoffkas were not sister ships, and the differences between them can best be shown in a short table:

	<i>Novgorod</i>	<i>Vice-Admiral Popoff</i>
Year of launching	1873	1875
Guns, 2	11-inch	12-inch
Barbette armor	7 inches	9 inches
Deck armor	1 inch	3 inches
Engine power	2,000 horsepower	3,066 horsepower
Screws	6	4
Speed	6 knots	8.5 knots
Draft	13 feet	13 feet
Diameter	121 feet	130 feet

The directing of the guns was done by aiming the ship. Unfortunately the results of target practice, which certainly must have been exceedingly interesting, were never published. The popoffkas did create the desired steady gun platform, but that was all. If there was even a mild sea running, the decks were awash. And if there was a heavier sea running, something else happened: the circular ship, with its flat bottom, would not "ride" a sea; it was just battered by the waves. The ship was strong enough to take such battering but the crews were not.

Naval men everywhere were not a little curious when the Russo-Turkish War broke out four years after the popoffkas were ready. But they never learned how the circular warships performed in combat, as both of them were moored in Odessa Harbor. What

*This native lighter, used by an older civilization and representing the basic shape of today's boats, is at Cochin on the Malabar (or West) Coast of India. These boats have no ribs and are sewed together with coir rope made from the fibers in the husk of the coconut. Holes are bored along the edges of the planks and the coir rope is threaded in and out. The vessels are exceedingly picturesque as they sail back and forth from the harbors to the large ships that cannot come inside the coral reefs that edge so much of almost all tropical coasts.*

Paul McC. Wiswall, '09



naval men did learn, after a suitable interval of time, was that the popoffkas had had an interesting adventure earlier. They had traveled up the Dnieper River until the commander (Popoff himself had died in the meantime) decided to turn them around and go back to the sea again. During the maneuver they were caught by the current, and nothing their commanders or crews could do brought them under control again. The current not only swept them down river, but it also whirled them around and around until everybody aboard was too sick to care much what happened.

In view of these events it sounds doubly strange that there was a successor to the popoffkas, but there was. The Czar, Alexander II, had watched their progress and adventures, presumably by reading carefully worded official reports. There was one fact which stuck in his mind: the popoffkas did not roll. That was the kind of ship he wanted — a vessel on which one would not become seasick in front of one's subjects. Since he was Czar, he could have such a ship built for his personal use. But he had another wish: his yacht should not look like a warship; it should look like a yacht. The designer solved the problem by taking a yacht of customary lines, but of most extraordinary beam, and building it on top of a modified popoffka which was not quite circular. The resulting monstrosity was 235 feet long, had a beam of about 155 feet, and a draft of only 6½ feet.

The name of this unusual vessel became *Livadia*, which was also the name of the Czar's summer palace in the Crimea. But the *Livadia* was not built in Russia; it was ordered from the firm of John Elder and Company in Scotland. Scottish businessmen do not laugh at a customer when he is present, most especially not at an indubitably solvent customer. John Elder and Company merely made sure that the price was right and that all the specifications were met. The speed had to be 14 knots or John Elder and Company would not be able to make the sale. They made sure that the speed was almost 16 knots. The Russians accepted her after a fast trial run in calm weather.

Then the *Livadia* was to be taken to the Black Sea. The Bay of Biscay was stormy as usual. As promised, the *Livadia* did not roll — or only very slightly. However, the waves, acting on a flat bottom of such size, battered a few watertight compartments into being no longer watertight. By the time the harbor of El Ferrol (northern Spain) was reached, the crew was almost completely exhausted. In the end, however, the Black Sea was reached and the *Livadia* did serve as the imperial yacht and, after the Russian revolution, became a repair ship for the Russian Navy. She was finally broken up in 1926. She was afloat longer than most ships, but she was not an improvement.

Now the main reason for designing both the popoffkas and the *Livadia* had been the desire to have a steady ship — a ship on which one would not get seasick. Sir Henry Bessemer, the famous inventor, who was so susceptible to seasickness that he needed more than 24 hours to recover from a trip across the English Channel, tried to solve this problem by having the saloon of the ship suspended and equipped with counteracting hydraulic cylinders. Such a ship was actually built (Sir Henry lost \$170,000 in the ven-

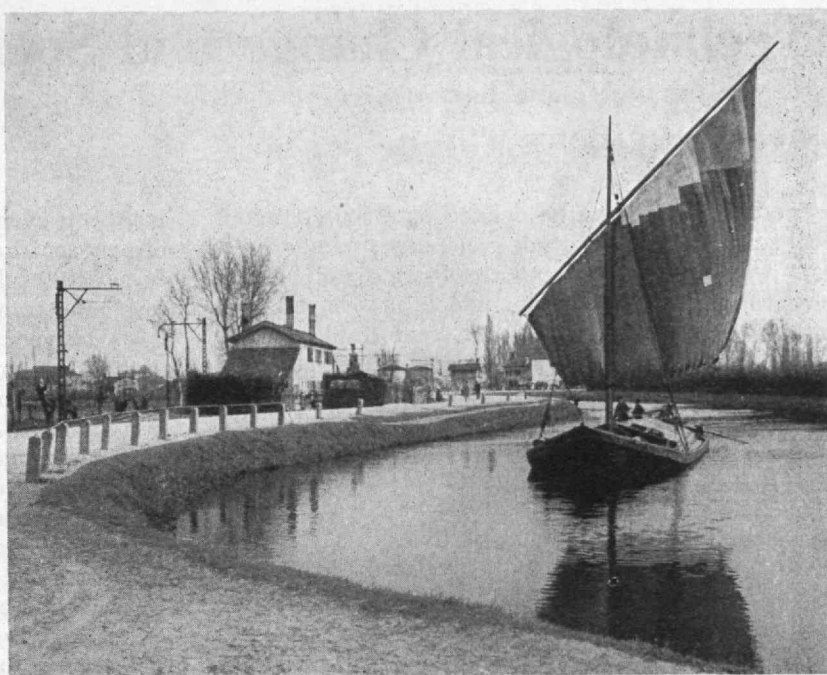
ture) and was singularly unsuccessful; but since this was essentially an in-board improvement it does not interest us here. That the *Bessemer* handled poorly and had a pronounced tendency to run into piers, both French and English, was probably due to her excessive length, and may be attributed as a mistake in design rather than a premeditated change.

But there existed one more possibility for ameliorating a ship's motion: the twin-hulled ship, usually called the catamaran. It was actually a left-over from the days of the old raft-faithfully, and usefully, preserved too in the outrigger canoes of the South Seas. However, the invention of the twin-hulled craft was indubitably made independently quite often. Such craft is occasionally mentioned in classical antiquity, Mediterranean region. It was also used in the South Seas; for example, by the Maori, before the white race arrived there.

Of recent ships of this type the first one seems to have been a catamaran built by Sir William Petty in 1663. It was used for some time between Dublin and Holyhead until it was lost in a storm. Petty's ship was built of wood, but the next catamaran which was actually used was made of iron. Invented by one Peter Borrie, she was appropriately named *Gemini*, after the constellation of the Twins, and was built in 1850. She consisted of two rather long hulls, which were 157 feet long with a beam of 8½ feet. The two hulls were placed 9½ feet apart and then joined by a deck which had, consequently, a width of 26½ feet. Propulsion was by means of a paddle wheel between the two hulls, driven by reversible engines — a fairly new idea at that time. The *Gemini* attracted a lot of attention, but as a business venture she was not successful.

The next large twin hull was built by an English captain named Dicey who had spent many years of his life in Calcutta where he had been impressed with the stability of native outrigger canoes. After returning to England, he designed a twin-hulled steamer (influenced to some extent, no doubt, by the *Gemini*) for service between England and France. Expecting that the vessel might be slower than a single-hulled ship, the designer paid special attention to luxurious cabins, a spacious main lounge which was called a "saloon," and to passenger comfort generally.

The ship was put into service in 1874 and bore the name *Castalia*. She was 290 feet long with an over-all width (the term "beam" may be wrong when applied to a catamaran) of 60 feet. Her bridge was about in the middle, atop the main saloon. Her four funnels were placed in two pairs and propulsion was by two paddle wheels between the hulls. A total of 1,000 passengers could be accommodated. As for contemporary reaction to the ship, quoted below is a clipping from the *London Times* during the period when she was still news:



Benjamin W. Irvin, Jr., '38

*This boat, whose curve of sail balances that of the Brenta Canal water line near Venice, Italy, has a broadness of beam which could have been the basis of some of our World War II ships — perhaps even the LST's!*

Returning from our autumnal tour, we determined to give the *Castalia* a trial. The weather was unusually boisterous; at Calais it was difficult to stand against the gust of wind which swept across the pier. Outside, the sea ran high, and the usual discomforts of the passage presented themselves to us. The *Castalia*, when she left the pier, seemed to glide to the turbulent waters outside. For a moment it puzzled one to find the deck as firm and level as a dinner table, and yet waves breaking all around. We performed the passage to Dover in about two and a quarter hours; the motion was very slight indeed, about as much as in the ordinary steamers after they get within the harbor of Dover or Calais . . . every few minutes there was one single roll of about three degrees. There was no tremulous motion from the paddles. I explored the saloons for indications of straining, but found none; the surface of the paint was without a shadow of a crack, and throughout the passage there was no creaking noise. When we arrived in Dover the decks before and aft of the funnels were as dry as when we left Calais. The sea was enough to try the regular steamers, but on board the *Castalia* children were playing about, every one was perfectly comfortable, and I can safely state that it was the first time I ever crossed the Channel without seeing a sign of seasickness.

As this narrative shows, the *Castalia* fulfilled many of the hopes of her designer and her investors. She had only one drawback: she was slow. The advertised speed of 15 knots was never reached; on the average, she traveled at about two thirds of that speed. The reason probably was that the second paddle wheel, situated in the space between the two hulls behind the first, exerted drag instead of helping.

Since the *Castalia* of 1874, and a catamaran-like ship named *Vulkan*, with which the Imperial German Navy experimented before World War I, there has been a lack of interest in twin-hulled ships — now  
(Concluded on page 174)



# Technological Change and Social Policy

By PAUL MEADOWS

SOCIAL policy may be defined as a self-conscious search for a more adequate adjustment to our way of life. It is, in other words, a search for new physical or social inventions which, it is hoped, will make living more pleasant and comfortable. In any changing culture it is an inevitable and ceaseless search, but in a changing technological culture, such as that of the United States, it is an imperative for survival.

The rule of modern industrial culture is one of mechanization, for mechanization not only transforms the surfaces of contemporary living but stirs its depths. Modern people have encountered (and have deliberately sought to encounter) the machine in every area of their existence. An illuminating discussion on this fact is presented by Sigfried Giedion in *Mechanization Takes Command*.<sup>1</sup> Industrial people have turned to machine technology as a new, a modern, methodology of social adjustment.

Unhappily, the fundamental equilibrium which may be established at any one time in a given system of techniques is precarious and momentary. Innovations seem to start chain reactions of change in many seemingly unrelated areas of social living, and thus new and unexpected adjustments become necessary. First of all, then, the need for social policy arises from the functional interdependence of technological inventions.

## Problems of Interrelated Change

Students of modern technology are deeply impressed by the manner in which inventions in one area of modern life are linked with inventions in other areas. Indeed, this technological symbiosis, or mutual dependence, lies at the very root of the general concern with the problem of technology and social policy. Technology itself is not merely a mode of social ad-

justment; even more significantly, it is a major cause of new social adjustments. In a most thorough study of agricultural technology and social change, an interbureau committee of the Federal government suggests this very point as follows: "Scientific advances in agriculture constantly release labor at a time when employment opportunities are no longer open in urban industry. . . . Lacking other alternatives, the surplus hired men of agriculture swell the ranks of migratory farm workers, apply for direct relief, or find some shelter in subsistence farming, too often in the poorer localities."<sup>2</sup>

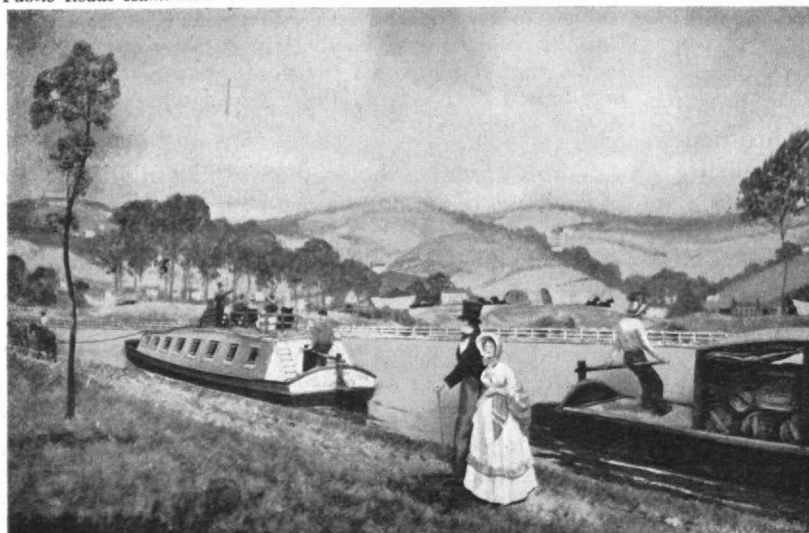
Sociologists Ogburn and Nimkoff have suggested a classification of sequences and concomitant variations of technology and society which summarizes these problems of interrelated change: (1) A major material invention may have immediate multiple effects. For example, radio, and now television, exert influences on recreation, entertainment, transportation, education, religion, business, government, and so on. (2) A single invention may have a long series of consequences flowing from it. New forms of labor and new class relationships evolved as a result of the invention of the cotton gin which made possible new industries, new clothing and different styles, and ultimately changed our conception of manufacturing. (3) A given social condition may itself represent the net result of a number of converging inventions. We may cite the way in which the declining birth rate is linked to the factory system, changing occupational patterns, smaller homes, greater individual mobility, and so on. (4) A cluster of inventions may have far-reaching derivative effects, such as are represented by the interrelationships between atomic energy conversion and medicine, power generation, international organization, military strategy and defense. (5) Finally, social inventions may require physical inventions for their facilitation or control. For example, modern national defense and military programs could only be developed upon an adequate base of inventions in communication, aviation, and organizational innovations.<sup>3</sup>

It is possible to go beyond the fact of interrelated change to the description of patterns of culture growth. Thus, we know that interrelated change is accumulative in character. A physical invention or group practice, introduced into the culture, requires additional inventions for its integration or incorporation into the life of the society. For example, there is the case of the automobile necessitating

*The illustrations in this article present examples of technological changes in the field of*

## 1825 — The Erie Canal

Public Roads Administration



## ***New Inventions Initiate Chain Reactions of Change;***

### ***They Require New, Unexpected, and Often Sudden***

#### ***Adjustments to a New Normal Way of Life***

safety and traffic legislation, improved roads, safety education, insurance services, and giving rise to the establishment of new governmental agencies. Again, interrelated change is elaborative in character. A new invention must be improved; it must be made more dependable, flexible, sensitive to control; it is called on to perform additional tasks; it may be thrust into novel situations requiring new technics and technical skills. Aviation is a first-rate example. Still again, interrelated change is accelerative in character. As the stock of existing technology and technics enlarges, the rate of discovery and invention increases — at least for a period. The pattern of increase is like that of the compound interest curve but of course cannot increase indefinitely. Like all phenomena of growth, the beginning is slow; there is then a period of rapid growth and development, and a deceleration as saturation is reached, or as one form of growth is replaced or supplanted by another. Even in the period of most rapid growth, however, the rate of change is not uniform or constant but irregular, for growth in one area of social life is more rapid than in other areas. Several factors create nonuniformity and strains in culture change: differential rate of borrowing, the blocking of the development of one area of society by the vested interests of another, fear of the new, or legislation for “redistributing” a nation’s wealth. Finally, interrelated change is integrative in character. The elaboration of a given culture complex — for example, transportation — calls for devices which will fit it into the total pattern of the culture. This work of integration in a machine society can never be complete. It may, indeed, be a perennial source of dissatisfaction. Yet it is likewise the perennial necessity which mothers invention. An inventive civilization survives by its inventive wit.

#### ***Problems for Social Policy***

A changing culture needs some way of anticipating the rate and the pattern of change to which it is subject. This need is dictated by the principles of growth outlined in the preceding paragraphs.

Unhappily, as S. Colum Gilfillan<sup>4</sup> has shown, the record of successes in the field of prediction is slight and not reassuring. For dependable generalizations, we still look forward to an intensified scholarly research in the future. At present, however, the predictability of social change is based upon the following experiences. First, trend lines can be established and the extrapolation of observed trends pro-

*transportation which in retrospect have startlingly affected our way of life.*

vides some basis for assessing the probability of certain future events. In any area of technological or social change, determination of trends is facilitated by observations in related fields, for any single invention is, after all, “a multitudinous collection of little ones.”<sup>5</sup> Second, embryonic inventions have a slow growth; they grow rapidly in their adolescent stage, and when maturity is reached the rate of advance is once more diminished. Third, inventions have causes, and cause and effect relationships can be formulated. Such invariant relationships have predictive value when properly established. Fourth, curiosity, coupled with analytical summaries of failures and successes of previous predictions, provides certain checks and balances which should establish reasonable criteria for the judgment and evaluation of predictive formulas. Finally, time will often elapse before the full effects of an innovation have matured. This period provides an excellent opportunity to study and forecast other inventions which the present one requires or will make necessary. In general, then, sound social policy can and should make some attempt to gauge the pattern and rate of change.

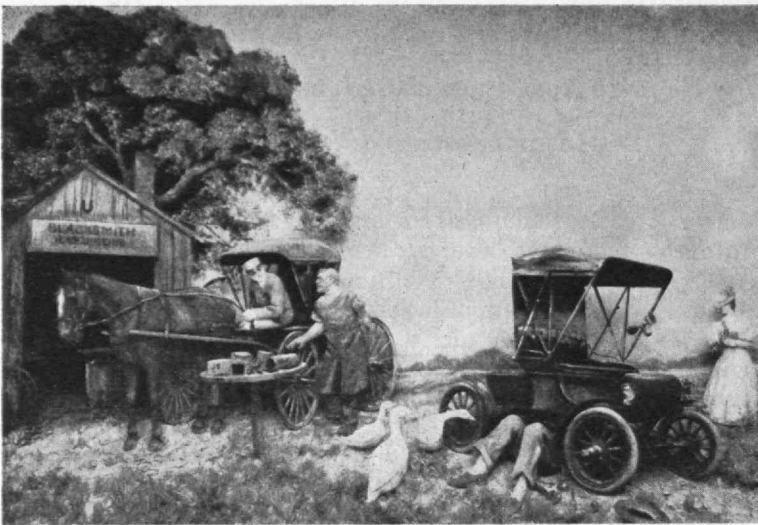
The problem of anticipated change is aggravated not merely by the lack of scholarly studies, but even more by the presence of certain harmful social attitudes. Sentimental optimism, wishful thinking, the popular resistances offered by tastes, customs, and laws, preoccupation with material profit, and a total unconcern with social consequences — all these factors have delayed systematic efforts to answer the questions of anticipated inventions and their usually unanticipated consequences. This fact means, then, that social policy must reckon with the many ways in which individuals and groups, even the total culture, inhibit the process of change.

#### ***1869 — The Meeting of the Rails***

*Public Roads Administration*







Public Roads Administration

### 1900 — The Horseless Carriage

Paradoxically, the resistances often spring from a social philosophy about change itself. In a comprehensive catalogue Hornell N. Hart, sociologist, has outlined these failures and blockages in social attitudes as follows:<sup>6</sup>

#### A. Self-satisfied attitudes:

1. Fatalistic optimism: "Progress is inevitable; all we need to do is to accept and use it."
2. Aggressive culture conceit: "Progress has been and will be the peculiar achievement of our people, or race, or nation; we should spread our culture over the rest of the world."
3. Conservative exploitation of past progress: "We have arrived; the progress of the past has brought us to the present ideal state of affairs, which may now be used and enjoyed."
4. Proud opposition to changes from past achievement: "Let well enough alone; whoever attempts to modify the wonderful institutions devised by our forefathers should be repressed or punished."
5. Changelessness: "What has been good enough for all my ancestors is good enough for me; let it remain as it always has been."

#### B. Pessimistic attitudes:

1. Sentimental pessimism: "The good old days are never to return; let us mourn them."
2. Fatalistic despair: "Inevitable disaster impends; get what you can out of life before the crash comes."
3. Cyclicalism: "Civilizations rise and fall in waves or cycles. At present we are past the crest of a culture wave and are on the decline into a new dark age. All we can do is to recognize this fact and adjust ourselves to it."

#### C. Reconstructive attitudes:

1. Repristination: "Let us go back to the old days and restore the glory that is departed."

2. Panacean alarmism: "Unless we act quickly civilization will perish; come and help put into operation the one essential remedy."
3. Meliorism: "Progress is the fundamental trend, but it is subject to reverses (which) may be mitigated and even eliminated. . . ."

#### D. Agnostic attitudes:

1. Anthropological positivism: "Progress and regress are subjective, and therefore unscientific terms."

It is possible that this catalogue of resistances is simply an armchair listing of hypothetical cases. However, a careful study of several historic social innovations by Theodore K. Noss suggests a contrary view.<sup>7</sup> Noss investigated the opposition to seven social

changes, all eventually accepted by the American people: parcel post, postal savings, rural free delivery, bobbed hair, woman suffrage, simplified spelling, and hookworm treatment. He concluded: "As the change cannot be adopted until society agrees to accept it, enough time intervenes between the introduction and social acceptance for organized resistance to appear. The first to oppose the innovation are those who conceive of it as interfering with their interests in society. Under this threat special interest groups become more self-conscious. The members of the group turn to each other for consultation and support. This interaction serves to consolidate the group internally and partially to isolate it from the larger society, but at the same time the members imaginatively identify themselves with society, especially with the social good. Typically, they exaggerate the importance of their group function and may call themselves the cornerstone of the social welfare. . . . They may predict that social destruction will be the end result of the adoption of the innovation. As a result of their interaction, they develop what they call the 'truth' of the situation. . . ."

In a similar review of the resistance to technological innovations in several fields — transportation,

(Continued on page 169)

### Twentieth-Century Highway Masterpiece

Public Roads Administration



# THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

## School of Industrial Management for M.I.T.

### *Alfred Sloan Foundation Gives \$5,250,000 to Purchase Building and Underwrite Its Educational Program for 10-year Period*

A GIFT of \$5,250,000 from the Alfred P. Sloan Foundation, Inc., for the establishment of a School of Industrial Management at the Institute was announced by Karl T. Compton, chairman of the M.I.T. Corporation on December 20. When put into operation, the new School of Industrial Management will increase to five the schools of instruction at the Institute: in addition to the Schools of Science, Engineering, and Architecture and Planning, a School of Humanities and Social Studies has been announced.

The concept of the new school will be to correlate the complex problems of management in modern technical industry with science, engineering, and research. The objective will be to prepare young men of today better to meet the exacting demands of industrial management. In making the announcement, Dr. Compton said:

Plans for the new school have been under consideration for some time. They are announced now because desirable facilities are available. Both the Institute and the Sloan Foundation realize that the present threats to our peaceful way of life may interpose delays and complications in the development of this new program. However, the urgent need for the highest standards of management which can be developed in the industrial field is ever with us, whether our nation is in a state of emergency or in a state of peaceful prosperity. In fact, industrial management has been termed America's most powerful "secret weapon."

Consequently, the plans for the new school will go forward as rapidly and effectively as conditions permit in order that its contribution, in either war or peace, may be realized as rapidly as possible. Approximately \$2,500,000 of Mr. Sloan's gift will be used to provide the essential facilities, including housing and other capital costs. The balance, at the rate of \$275,000 a year for 10 years, will serve to underwrite its educational program and administration.

In confirming the gift of the Alfred P. Sloan Foundation, Inc. in establishing the new School of Industrial Management, Alfred P. Sloan, Jr., '95, said:

It has been my observation over an experience of many years in technical industry that executives with a background of science and engineering are unusually well qualified to deal with the intricate problems of industrial management in our technical enterprises. And American enterprise is passing more and more into that area. That really is the basis of my concept in establishing this School.

Few realize the broad and exacting demands made upon the industrial executive of today, especially in large-scale enterprises. While the exercise of sound business judgment will always be the keystone of a successful industrial executive and a progressive enterprise, yet to reach the highest

level of effectiveness, executive decisions must be supported by a scientific appraisal of all related facts and circumstances. Industrial management has passed through a long process of development as our industrial age has evolved. Today it has become in every sense of the word, a matter of science. Therefore, it seems entirely logical that a scientific background offers an unusually healthy climate for the development of tomorrow's industrial executive.

Our present national situation dramatizes a recognized fact; namely, that production is both a source of economic progress and the foundation of national security. It is equally true that management is the motivating force that determines the effectiveness of production.

In the administration of the school, it is my hope that emphasis will at all times be laid in bringing into the training, in a truly realistic manner, the practical problems that face the industrial executive in his administrative capacity. The contribution that the school can make in the future to higher standards of economic leadership will, as I see it, determine the extent to which that is accomplished.

Dr. Compton revealed that the new school would be housed in a separate building, and that Lever House, formerly the headquarters of the Lever Brothers Company in Cambridge, had been purchased for that purpose. The building, which is well adapted for the purposes of the school, stands on a large plot of land adjoining the Institute's grounds.

Use of the existing structure will avoid dependence on new building construction at this time, when materials and labor should not be unnecessarily diverted from the requirements of the national emergency. If this country should be plunged into all-out war, the newly acquired building can be temporarily utilized for emergency projects.

In accepting Mr. Sloan's offer to establish the school, Dr. Compton and James R. Killian, Jr., '26, President of M.I.T., said in a joint statement:

This magnificent gift of Mr. Sloan, whose gifts to M.I.T. now aggregate \$7,000,000, makes it possible for the first time to fully capitalize the Institute's resources in a program which will contribute most effectively to the broader status and higher scientific level of industrial management. The record of the Institute's graduates, of which Mr. Sloan is an outstanding example, bears out our convictions as to the effectiveness of a scientific background as a foundation upon which to build a broad concept of management.

Our technological age is based upon the concept of fundamental knowledge gained through scientific research together with the technique of applying this knowledge through managerial skill and inventiveness. These technological developments have resulted in our great industries whose productivity and resulting service to the public depend upon intelligent administration. We believe that such administration must increasingly represent a union of scientific knowledge and its application for managerial ends. Our program will be based on the conviction that industrial management is a profession which can be developed and taught.



## Humanities — the Fourth School

**R**EPLACING the Division of Humanities, there has been established a School of Humanities and Social Studies at the Institute, giving formal recognition to programs long emphasized at M.I.T. in general education and in social science. In making this announcement in December, James R. Killian, Jr., '26, President of M.I.T., said:

M.I.T.'s fourth school will have the responsibility for providing the strongest possible program in general education for students studying in the fields of science, engineering, and architecture. In addition, the new school will be a center for creative and professional work in such social sciences as economics, which are appropriate to an institute of technology.

Dr. Killian also announced the appointment of Professor John E. Burchard, '23, as dean of the new school, which will have equal status with the Schools of Science, Engineering, and Architecture and Planning. Dean Burchard, since 1948, has been dean of the Division of Humanities, which is now replaced by the School of Humanities and Social Studies.

The creation of the new School of Humanities and Social Studies does not mean that M.I.T. plans to develop a school or college of liberal arts or to give degrees in the liberal arts. Dr. Killian emphasized that:

We shall remain an institution of limited objectives, offering as we have for many years a program centered around science, engineering, architecture, and management. The new school is designed to enable the Institute to broaden and deepen its activities in these fields and to educate men who can be effective citizens as well as effective professional practitioners.

Our purpose is to give men professional competence and at the same time an insight into the society in which they live and to which, as scientists and engineers, they will have great responsibilities.

The new School of Humanities and Social Studies and new sequences in humanities for the professional

programs of M.I.T.'s other schools were both recommended by an M.I.T. Faculty Committee on Educational Survey in its report made public in September, 1950.

The M.I.T. Faculty has approved plans for the integrated program of humanities in professional technical curricula, to include: (1) A two-year sequence of courses in humanities and social science, to be a required part of the freshman and sophomore years of all professional courses at M.I.T.; (2) Four additional courses in these fields during the junior and senior years of all professional courses, with provision for six such courses for students who wish to devote more time during those years to the humanities and social sciences.

The recommendations of the committee, subsequently approved by the entire M.I.T. Faculty and the members of the M.I.T. Corporation, direct the new school to "consider the advancement of knowledge an essential part" of its program, to assume "the responsibility for planning and administering the program of general education as a part of the common curriculum in science and engineering at M.I.T., and to offer professional courses leading to graduate as well as undergraduate degrees."

The new School of Humanities and Social Studies at M.I.T. will be guided in its development by the recommendations of the Committee on Educational Survey. In its report, the committee proposed a unit to serve the Institute "by planning and administering a general educational program for all M.I.T. students, designed to develop an awareness of the interrelations of the scientific, technical, and literary cultures, and a sensitiveness to the diverse forces that motivate the thoughts and actions of people. This general educational program, like all components of M.I.T. education, will grow out of the creative work of the departments, and it must be an integral part of the professional curricula, far more than a mechanical mixture of the conventional literary and technical cultures."

## Ground Broken for Laboratory in Food Technology and Biology

On November 15, members of the family of the late John Thompson Dorrance, '95, and ranking officers of the Campbell Soup Company (of which Mr. Dorrance was president from 1914 to 1930) were guests of honor at outdoor exercises to break ground for the Institute's new John Thompson Dorrance Laboratory. Taking part in the exercises were (left to right): President Killian; Karl T. Compton, chairman of the M.I.T. Corporation; Oliver G. Willits, Vice-president, Campbell Soup Company; and Mrs. John Thompson Dorrance.

The new seven-story building, 57 by 200 feet, will provide critically needed facilities for the Institute's Departments of Biology and Food Technology.



M. I. T. Photo

## At the Council

WITH an attendance of 113 members and guests, the 278th meeting of the Alumni Council was called to order by John A. Lunn, '17, President, on November 27, at the conclusion of dinner in the Campus Room at the M.I.T. Graduate House.

As first speaker of the evening, Gerald B. Tallman, Associate Professor of Marketing, outlined the evolution of the Alfred P. Sloan Fellowship Program for training young men in executive development. Although the M.I.T. program is the smallest of the executive training programs now in operation in colleges in the United States, it is the oldest, most selective and comprehensive. More than 1,000 companies are circulated each year for their endorsement of candidates who come to the Institute for a year of graduate study with expenses paid by the Sloan Fellowship Program and the candidate's employer. This year 14 young men have been selected and are now studying at the Institute.

President Lunn then called on Professor John Wulff, of the Department of Metallurgy, who is director of the new Sloan Metal Processing Laboratory now under construction at Vassar Street and Massachusetts Avenue — adjacent to the Guggenheim Aeronautical Laboratory. Professor Wulff described the physical facilities of the new laboratory for instruction and research in all phases of metal operations, and outlined the manner in which the new laboratory would be used on a co-operative basis by the Departments of Mechanical Engineering, Metallurgy, and Business and Engineering Administration.

This new program will combine, in a manner not previously attempted in an educational institution, the theoretical and practical aspects of metal processing. Professor Wulff pointed out that each year 800 students take machine tool laboratory and 800 students study methods of metal forming. At the present time, about 40 bachelor's, 15 master's, and 12 doctor's theses are being undertaken in this co-operative program which the metal industries are supporting, especially since a definite need exists to introduce scientific procedures in metal-processing operations which, for generations, have clung to apprenticeship methods. Although industry and professional groups are supporting research and teaching in the new laboratory, Professor Wulff emphasized that the new laboratory would be used primarily for undergraduate instruction. Nevertheless, the close contact between the Institute and industry is expected to have many mutual advantages in this program.

During the business portion of the meeting which preceded these two addresses, Donald P. Severance, '38, Secretary, reported that between September 27 and November 20, 1950, eight M.I.T. clubs had been visited by seven different members of the Faculty and Alumni Council. A gavel was presented to C. Adrian Sawyer, Jr., '02, in appreciation of his splendid term of office as president of the Alumni Association for 1949-1950. It was also announced that George Warren Smith, '26, had been named chairman for the Association's Midwinter Meeting of Alumni in Greater Boston, which is scheduled to be held in Cambridge on February 1, 1951.

## Administrative Aide

THE appointment of Professor Gordon S. Brown, '31, as Associate Head of the Department of Electrical Engineering was announced in November by Professor Thomas K. Sherwood, '24, Dean of Engineering. Professor Brown, who is director of the Servomechanisms Laboratory, will share administrative responsibilities for the Department with Professor Harold L. Hazen, '24, who has been its head since 1938.

The Department of Electrical Engineering, the largest in the Institute, has a registration of 902 students, of whom 302 are studying in the Graduate School. In addition to its undergraduate and graduate educational program, the Department carries on research which, on the basis of budget, is as comprehensive as the operations of industries with comparable personnel. Thus, the administrative responsibilities of this single Department are comparable to those of many small colleges. Its academic staff, including the junior grades of assistant and research assistant, totals 260 members, while the entire personnel numbers 750. During the postwar peak, student enrollment in the Department of Electrical Engineering exceeded 1,200. Associated with Professors Hazen and Brown is Professor Carleton E. Tucker, '18, Executive Officer.

Dr. Brown, a native of Australia, was educated at the Institute, received the degree of bachelor of science in 1931, the master's degree in 1934, and his doctorate in 1938. He joined the Institute's staff as a research assistant in 1931, was appointed assistant professor in 1939, associate professor in 1941, and became professor of electrical engineering in 1946.

Professor Brown is internationally known for his contributions in the field of servomechanisms. At the opening of World War II, M.I.T. had the only university servomechanisms laboratory in the country, and Dr. Brown and his colleagues at once undertook a program of research for the armed services that contributed notably to successful operations against the enemy. Since the end of the war, the laboratory has been engaged in research of important industrial significance.

## Employees Receive 25-Year Pins

A GROUP of Institute employees who collectively have served M.I.T. for a total of 2,020 years received service pins this fall, honoring their long service, at the first presentation ceremony of its kind in the Institute's history. Sixty-six men and women were thus honored with gold pins indicating 25 or more years of service. But exceeding all others in years of association with M.I.T. is Julia M. Comstock, long in charge of the Institute's historical records, who has served M.I.T. for 58 years. Miss Comstock came to the Institute in 1892, when General Francis Amasa Walker was president, and only 30 years after the Institute's founding in Boston. She has served during the administration of 10 presidents of M.I.T.

The pins were presented at exercises in which President Killian and Dr. Compton spoke and congratulated the veterans on their long service. High light of the ceremony was the presentation of Miss Comstock's pin by Professor Emeritus Samuel C. Prescott, '94, for-



THE Visiting Committee on the Department of Aeronautical Engineering\* held a meeting on March 21, 1950, to inspect the Department's facilities and discuss its activities with the Faculty. The morning and part of the afternoon were largely devoted to inspection of the facilities, which included the new Naval Supersonic Wind Tunnel, graduate and undergraduate laboratories, and classroom accommodations. After the inspection, a conference was held and the Committee was informed of the activities and problems of the Department. The conference adjourned late in the afternoon to be resumed informally at a dinner at the Union Club.

From informal discussions conducted during the year, it was possible to poll the opinions of the members of the Committee on certain subjects, the results of which are expressed by the following points of agreement:

1. The Department of Aeronautical Engineering is doing an extremely effective job and is staffed by competent and active men.

2. The facilities of the Department are effectively operated and well cared for.

3. An alteration to the Wright Brothers Wind Tunnel, to provide for a new transonic intermittent chamber, is desirable.

4. The aeronautical courses now in force, which include a co-operative course, a course directed toward a degree of aeronautical engineer, and the honors course are excellent additions to the Department's curriculum.

The Committee feels that, whereas graduates from this Course have been successful in the past and there is every reason to believe that the success will continue, every effort should be made to follow the graduates' careers so that the results of experimentation and changes in student curriculum can be evaluated. The Committee believes that a major technical study should be made to cover the activities of the rank and file who may not be singled out by publicity. Such a general study would not only be useful to the Institute as a whole, but permit comparison between the results of courses in the various departments of the Institute. It is realized that this is a big undertaking and that some compromises will have to be made. It is suggested that the statistics cover a period of the past 25 years, and that they be reviewed and added to at some regular interval — perhaps at five-year periods.

Discussions ensued concerning the reason for the decrease in enrollment of students in aeronautical courses, and questions were raised as to whether such a decrease was general and applied to other aeronautical engineering schools as well. This problem, which has been a matter of concern to the Department for some time, was discussed with the chairman of the Committee who, in turn, circularized and obtained information on student enrollment from 13 engineering schools. The result of such investigation indicates

\* Members of this Committee for 1949-1950 were: Luis de Florez, '11, chairman, Godfrey L. Cabot, '81, Theodore P. Wright, '18, James H. Doolittle, '24, George J. Leness, '26, Preston R. Bassett, and Leroy R. Grumman.



M. I. T. Photo

To Julia M. Comstock are M.I.T. Faculty and staff appreciative for maintaining an accurate record of their associations with the Institute. Her years of service exceeding the 25 years depicted on the pin shown in the upper left corner, Miss Comstock is well versed in M.I.T.'s history.

mer Dean of the School of Science and Head of the Department of Biology and Public Health for many years. Next in years of service were Carl G. Selig and Edgar L. Pung, with 45 and 42 years respectively.

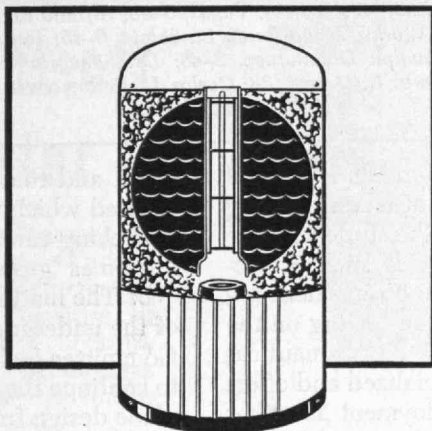
The 41 men and 25 women receiving the pins were: **Admissions Office:** Anne L. Riley; **Alumni Association:** Madeline R. McCormick; **Buildings and Power:** James S. Alexander, Robert Baillie, Walter G. Baker, James B. Broderick, Herbert M. Candow, Raymond S. Howell, Robert K. Jenner, Alexander H. Johnson, Norman Lander, Patrick B. Manning, Ralph Metzger, Philip Monticelli, Alfred W. Moore, John M. Moran, William P. O'Connor, Edmund J. Petacchi, Ernest L. Roberts, Abner Stodder, Theophilus Tucker, Berthold U. Uriot, Charles J. Webber; **Department of Business and Engineering Administration:** Olive Barnard; **Chemical Engineering Department:** Harold H. Carter; **Chemistry Department:** Norman B. Carter, Mrs. Marion S. Cunningham, Edward J. Curtis, Charles L. Gallagher, Edith M. Nelson; **Civil Engineering Department:** George W. Broussard, Ernest O. Dennison; **Dormitories:** Thomas H. Chambers, Sidney W. Elder, Wilfred P. Samuels, Archibald H. Sutherland; **Division of Laboratory Supplies:** Mrs. Edward Driscoll, Arthur B. White; **Dean of Students' Office:** Verna L. Keith; **Electrical Engineering Department:** Ednah Blanchard, Frederick E. Broderick, Henry J. Lawrence; **Historical Records:** Julia M. Comstock; **Letter Shop:** Doris E. Peabody; **Library:** Gertrude Perry, Louise Trainor; **Mechanical Engineering:** Harry C. Artis, Herbert A. Johnson; **Medical Department:** Alice M. Browne, Mrs. Harold A. King; **President's Office:** Mrs. David W. Edwardson; **Physics Department:** Carl G. Selig; **Registrar's Office:** Marjorie J. Doherty, V. Louise Holmer, Mary C. Hurley, Mrs. Joseph C. MacKinnon; **Superintendent's Office:** Louise S. Buttrick, Elizabeth A. Young; **Walker Memorial:** Eugene Blacquier, Maude P. Lunney, Mrs. Mary E. Lynch, Mrs. Carlton MacLean, Edgar L. Pung, Irene Sullivan, Alexander J. Sylvestruck, Max J. Wall.

# BUSINESS IN MOTION

## *To our Colleagues in American Business . . .*

The geometric form that combines the maximum volume with the minimum surface is the sphere. This fact has been obvious to man for centuries, but it was only a relatively few years ago that this principle was applied to a domestic water heater. It was reasoned that if a heater had a spherical tank, it would lose less heat by radiation than the conventional cylindrical tank. The theory was absolutely correct, but as is so often the case, making it practical was not easy. A sphere can of course be built up of segments, but that is a costly process, and in order to make a heater that would be competitive, as well as have maximum heating efficiency, it was desired to make the sphere in two halves and weld them together, with a central tube for the flue, which would heat the water from the center out instead of from the outside in.

In order to obtain easy weldability, plus the corrosion resistance of copper and the strength of mild steel, Herculoy was chosen. This is Revere's silicon bronze. Welded tanks made of it are non-rusting, long-lived, and easily meet code requirements for a 300-pound pressure test. The manufacturer who undertook production of this tank was exceptionally well staffed with metallurgical, design and fabrication engineers, so much so that it would have been logical to believe they could solve all the inevitable problems without assistance. Nevertheless, they asked Revere to collaborate with them, probably feeling, we believe correctly, that Revere's knowledge and experience added to their own would materially shorten and facilitate the work required to set up successful production methods.



One subject of examination was the drawing of flat sheets into hemispheres, which requires correct drawing sequences and anneals. Studies were made of the furnaces in the customer's plant, and the correct temperatures and annealing times were worked out together, so that the proper tempers were produced. Then the welding process was studied mutually with Revere's Welding Department. Methods, current densities, welding times and other factors involved in establishing a proper welding sequence were specified. Later, new welding techniques, such as the hydrogen-shielded arc, were incorporated.

The domestic water heater that resulted from this exceptionally thorough engineering job is extremely efficient in its use of fuel, and in its conservation of heat through reduction of radiation. It is reported that stand-by losses are so low that they are made up by the small amount of heat from the pilot, when no water is being drawn off. That is operating economy, while savings are also afforded by the non-rusting silicon bronze tank, an especially important factor where water conditions are such as to destroy ordinary metal quickly.

This case history of close collaboration is especially pleasing to Revere, because of the high degree of engineering talent employed by the customer. It paid even him to look outside as well as within for knowledge and experience. So we suggest that whatever it is you make it will pay you to ask your suppliers to add their knowledge to your own. They will be glad to do so, and the result may be pleasing and profitable indeed.

## REVERE COPPER AND BRASS INCORPORATED

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*The warmth and cordiality of this group from South America were evidenced last July when the M.I.T. Club of Venezuela in Caracas was organized, bringing the total of M.I.T. clubs to 86. Representing the youngest of the clubs with exuberance which resulted in definite plans to establish and maintain close association and co-operation with the Institute were (left to right): Gerald A. O'Connor, '29, Vice-president; Victor M. Lopez, '36; Melchor Centeno, '30; Felipe Echaniz, '43, Secretary; Walter V. Skees, '33; Oscar A. Machado, Jr., '43; Whitney Ashbridge, '26; Luis G. Jimenez-Michelena, '41; Enrique J. de Majo, 6-45; John W. Matthews, 10-44; Gabriel M. Disario, '28; Guillermo Machado-Mendoza, 2-46, President; Christa Kern, who acted as recorder; Diego C. Carbonell, 6-45; Armando Medina, '47; Juan A. Vegas, 6-45; Alfredo Rodriguez Delfino, 10-44; Dr. Curiel, (Harvard), President, National Institute of Sanitary Works; Hugo Perez La Salvia, 6-45; Rafael de Leon (Harvard); Ricardo Zuloaga, '42; Francisco Acevedo-Quintana, 6-46; Atahualpa Domínguez, 2-46; Dr. Sanabria (Harvard), Dean, Technological College; Ely Mencher, '38; Guillermo Zuloaga, '30; James E. Dorris, '38; Carlos L. Bethencourt, '48; David D. Brillembourg, '47; Nestor E. Perez, 2-46.*

that the lessening of aeronautical students is general and that it is the result of a number of factors, among which are: (a) a shift of interest of the students since the close of World War II to other fields, such as electronics and physics; (b) reductions in government appropriations for aeronautics; and (c) a feeling on the part of the students and parents that an aeronautical engineering course is too highly specialized and offers less opportunity for possible employment in other fields.

It was the opinion of the Committee that a properly trained aeronautical engineer, who graduates from the Department of Aeronautical Engineering, should not be considered more highly specialized than any other graduate of the Institute in respect to being competent to undertake jobs outside of his field. The Committee feels that some study and effort should be directed toward the counteracting of this misapprehension.

5. The development of aeronautics to the present date has been almost entirely directed toward development of air frames, engines, and flight accessories, with the result that at the present time the extraordinary progress made in aircraft appears to be far ahead of the ground facilities required for their operation. Such a one-sided development is understandable if it is realized that development of flight equipment has received tremendous financial support and has attracted the most talented, enthusiastic, and highly trained men. It is felt by the Committee that, in addition to training of aeronautical engineers, the Institute might well take notice of the vast opportunities for technical graduates in solving the tremendous problems which arise from the operation of aircraft

itself, and that perhaps courses or options could be devised which would interest students and graduates in seeking careers in this important phase of aviation known as "ground aviation."

6. The matter of original design exercises, as a part of the undergraduate curriculum, was discussed. The Committee feels that the Department has good reason to continue the policy of having students make an airplane design from specifications, and that it would be desirable to adopt the procedure current in architectural courses — that of comparing and criticizing designs with a view toward producing competition. It was also the Committee's belief that a small yearly prize for best or most original designs would be valuable in creating interest and stimulating thought. Various companies in the aeronautical field will be contacted by the Committee in an endeavor to obtain such prizes.

7. The Committee feels that the work and future of the Department of Aeronautical Engineering is in good hands, and it wishes to express its appreciation of the quality of the work being done and the keen interest shown.

### **Books Aid Bangkok University**

A GIFT of \$100 worth of new American medical books, sent by students of M.I.T. through the CARE-UNESCO (United Nations Educational, Scientific and Cultural Organization) Book Fund, has brought needed help to a Far East university whose book supplies are so low that students and professors must use mimeographed copies of the few precious texts they have on hand.



*- at Park View*

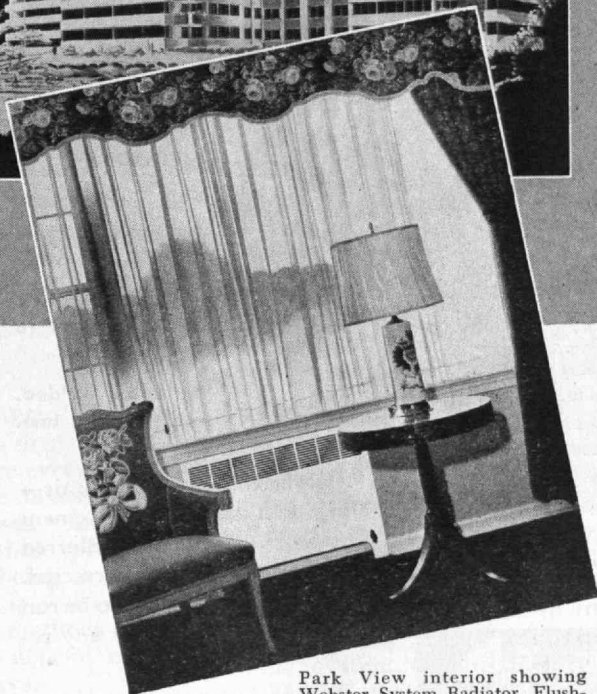
## Positive Heat shut-off at Each Radiator

The \$10 million Park View development in Collingswood, N. J., is the largest post-war apartment in the Philadelphia area. The arresting design with an almost unbroken expanse of window space has won professional acclaim. Television, radio and newspaper promotions have brought thousands to the model apartment.

The owners of Park View put comfort first. They provided a "Controlled-by-the-Weather" Webster Moderator System of Steam Heating. With fully recessed Webster System Radiation . . . Convactor Radiators with built-in radiator trap and valve. Each radiator has a convenient, accessible, easy to operate handle providing complete shut-off at tenants' convenience.

With the Webster Moderator System, heat is delivered continuously — plenty of heat in really cold weather, mild heat for mild days. The supply of steam is varied automatically with changes in the weather. There's a Webster Radiator Valve for 100% heat shut-off from each radiator — no dampers are needed.

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Park View interior showing Webster System Radiator. Flush-with-wall, takes no useable room space. Metal front provides easy access if necessary. Convenient, quick shut-off handle.

J. Lowery. The Builders are S. J. Lowery and E. J. Frankel. The architects were J. Raymond Knopf and Samuel J. Oshiver (associate). Engineers included Robert E. McLoughlin, Salvatore S. Guzzardi, and Robertson & Johnson. The heating contractor was Benjamin Lessner Co., Inc.

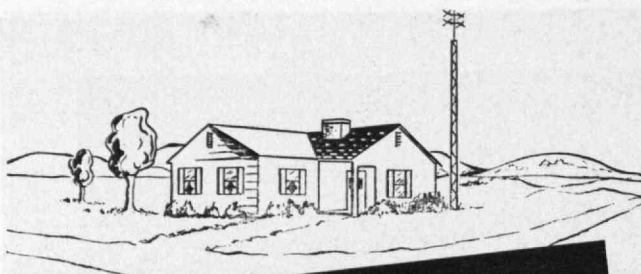
Park View was financed through County Trust Co., Tarrytown, N. Y., with the Seaman's Bank for Savings of New York as permanent mortgagee. It is insured by FHA.

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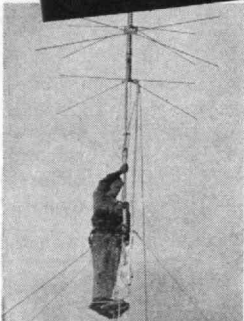
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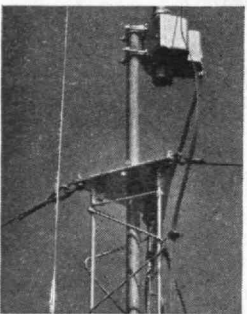




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Trylon masts permit easy antenna installation or subsequent adjustment.



Practically any TV antenna can be mounted on the Trylon.

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Get the antenna up in the air—and watch the big improvement in television reception! Blurred and weak images are corrected. Costly tubes don't have to be run at full power to assure any reception at all!

Trylon Antenna Masts bring big tower reliability in a small triangular shaped steel rod unit only 6 1/2" wide on each side and weighing only 20 lbs. for a complete 10-foot section. They can be installed quickly at modest cost, either on the ground or on a roof. Write for folder "M."

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# TRYLON TOWERS and MASTS

cept such a dangerous substance for transport at the time of the construction of the Hoosac Tunnel.

A disastrous fire in the wooden structure at the central shaft occurred during this period when a tank, used to store naphtha for experimental lighting, exploded. The central shaft's pumps were shut down by the fire and 13 men drowned, and work in the shaft was abandoned for several months. There were many charges of graft during the state direction of the work, and it was finally decided that the tunnel project could be better handled under contract, providing a contractor of the requisite financial resources and construction ability could be found who would be willing to accept the job.

### Period of Success (1869-1876)

Yankee pride must have suffered considerably when it became evident that not a New England, but a Canadian, firm should be given the contract to finish the tunnel: the firm of Walter and Francis Shanly. Born in the County of Queens, Ireland, Walter Shanly had emigrated to Canada where he had engaged in various pioneer construction enterprises, becoming general manager of the Grand Trunk Railroad. Among his other activities, he was a representative in the Canadian House of Commons. The Shanly contract was dated December 24, 1868, within a few months of the date of the patent by George Westinghouse for the railroad air brake; and the pioneer development in the use of compressed air for blasting and the railroad air brake thus continued during the same period. The nationwide celebration on the completion of the Pacific Railroads would occur in May of the next year (1869). Work on the one-half completed central shaft (a 15 foot by 27 foot ellipse in cross section) was resumed in the same month, and it was excavated to tunnel grade in about a year, making it possible to work the tunnel from four headings. Hindsight tells us that this shaft should have been started earlier; less than 15 per cent of the tunnel was excavated from the two headings leading from it.

The mixture of glycerin with nitric and sulphuric acids, which is nitroglycerin, was made in liquid form in a plant located near the west portal of the tunnel. A dramatic incident was to teach the Hoosac Tunnel folks of the greater safety of nitroglycerin in solid form. Until then, they had carefully followed the current literature, which warned against its supposedly more dangerous solid state, and the workmen during that era were not taking chances on any unproven methods for handling this volatile material.

### Nitroglycerin Experiments

Ten cartridges of nitroglycerin had been carefully packed under a buffalo robe in the sleigh of William P. Granger, chief engineer, in the phenomenally bitter winter of 1867-1868, a year before the start of the Shanly contract. He was to take them across the moun-

(Continued on page 162)

# What GENERAL ELECTRIC People Are Saying

T. M. BERRY

*General Engineering & Consulting  
Laboratory*

**CONTOUR FOLLOWER:** The optical contour-follower control is an automatic curve-following device. It has several unique features which make it ideally suited for use as a machine-tool control for the purpose of reproducing, in metal, a shape designated on a line drawing.

A number of machine-tool controls of the template-follower type are in general use for machining duplicates from a metal master pattern. The optical contour follower is used in making the master pattern itself.

In many cases thousands of duplicates are made from a single metal master, and only a few masters are required. The amount of time and labor involved in making these few accurate masters is relatively unimportant. Developmental manufacturing, however, requires that a master be duplicated only a relatively few times and that a much larger number of masters be made. In this case the time and labor involved in making a master are very important. It was for the purpose of reducing this time and labor that the optical contour follower was developed . . .

*"G.E. Review"  
June, 1950.*



J. P. DITCHMAN

*Lamp Department*

**PLANT LIGHT:** The advent of new artificial light sources stimulates the efforts of plant physiologists and other scientists to solve the fundamental riddle of how plants grow. Carbon arc incandescent lamps, sodium lamps, mercury lamps, and many combinations of these have been used in growth chambers where light, humidity, temperature, and air are controlled to grow plants entirely under artificial conditions. Today laboratories are being equipped with combinations of fluorescent and incandescent lamps for this purpose. . .

There are many laboratories in agricultural colleges equipped with rooms for growing plants entirely under artificial conditions, trying to develop methods independent of natural conditions. These research objectives, it is said, could lead (if successful) to political and economic consequences which could rival those of the atomic bomb. If we could maintain food production under ground, we could provide a hedge against some of the spectacular devastation feared in an atomic war.

*Illuminating Engineering Society  
Pasadena, California  
August 21, 1950*



H. A. LIEBHAFSKY  
A. E. NEWKIRK

*Research Laboratory*

**CORROSION STUDIES:** The annual cost of corrosion is so great that it is desirable to explore every promising technique for the investigation of corrosion processes. Among the most feared of these processes is pitting, which, being a form of localized attack, is well suited to investigation by methods such as radiography that depend upon the absorption of x rays.

To illustrate the value of these methods, the pitting of three kinds of stainless steel in ferric chloride solution at room temperature has been studied. Radiographs have been obtained that show how pitting varies with the kind of steel and with the degree of cold deformation. Furthermore, it has been possible to demonstrate that the direction of attack can be profoundly influenced by gravitational forces and by the occurrence of crevices. While the radiographs largely confirm past experience, they provide much detailed evidence that might escape visual observation . . .

Finally, it has been possible to measure the rate of pit growth on specimens continuously immersed—an important fact, because removal of the specimen from ferric chloride solution can stop altogether the growth of particular pits. The technique employed could be used to measure in favorable cases the rate of pitting in closed systems.

*National Academy of Sciences  
Schenectady, New York  
October 10, 1950*



J. P. RUTHERFOORD

*Apparatus Department*

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If you evaluate that in terms of lumens on the street, the people of Kansas City were paying approximately \$47.53 per 1000 lumens under the old system and are presently paying only \$12.80 per 1000 effective lumens under the new system.

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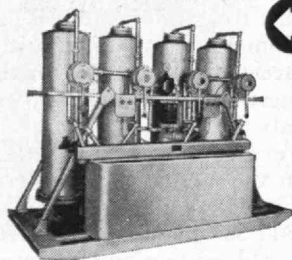
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Eliminate  
Rejects

Lower  
Manufacturing  
Costs

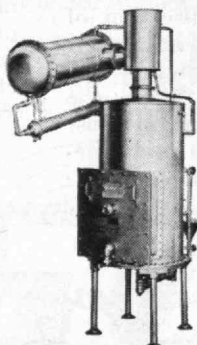
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## THE BLASTED BORE

(Continued from page 160)

tain to blast away an ice jam at the Deerfield Dam. The cartridges had been carefully warmed to 90 degrees F., then filled with nitroglycerin and packed in hot sawdust to keep the nitroglycerin liquid. When the sleigh upset on the icy road, Granger dove into a snow bank and waited for an explosion that did not occur. He picked up the cartridges, now frozen solid, placed them between his feet, and drove to the dam. There, he attached fuse and exploder, inserted the cartridges in the ice, and set off the fuse. Although the exploder drove its copper cap into the cartridge, the nitroglycerin itself did not explode. Later, when thawed out, it was exploded and the ice jam was cleared. This experience taught Mowbray never to transport nitroglycerin except in the frozen state. At about the same time, Alfred Nobel had learned to provide an absorptive dope for the nitroglycerin: a diatomaceous "rotten earth," called kieselguhr. To this solid combination, Nobel gave the name "dynamite."

The nitroglycerin structures were erected in a board-fenced area of about 10 acres. They all appear to have been of timber construction: heating was by stoves until superseded by steam heating, then a novel method, and the structures were lighted by oil lamps. In the Acid House, 150 feet long, the mixture of the two acids was prepared. In the well-lighted, 100-foot-long converting room, 116 stone pitchers sat in nine wooden troughs, filled with ice water. From glass jars, on a shelf above, the pure glycerin was siphoned, drop by drop, into the acid mixture in the pitchers, agitated by air from a blower. The fumes had to be closely watched. If they stopped unduly soon, because of a blower-engine stoppage, the mixture would surely take fire. The normal stopping of the fumes showed when the mixture was complete: The nitroglycerin was then dumped into a large tank at 70 degrees F., in which it settled under six feet of water. Passed into a churnlike wooden tank, the nitroglycerin was washed five times, a current of air stirring it. The water discharge ran via a wood trough through three barrels which caught the residue of nitroglycerin — the water finally discharging into a pile of rocks. When the nitroglycerin was thoroughly washed, a man (a brave man) with a shoulder-borne yoke carried it in two copper pails to the magazine, 300 feet distant. Twenty earthenware crocks contained the nitroglycerin in the magazine: They were placed in two feet of water in a wooden tank, kept at 70 degrees F. by a small steam pipe from the boiler. After 72 hours in the tank, the floating impurities were skimmed off, and the now chemically pure nitroglycerin was ready for packing. It was packed in tin cans, lined with paraffin, of 56-pounds capacity each. The wooden trough in which the tins were placed contained ice and salt to congeal the nitroglycerin. In this condition it remained, ready for use, in the magazine.

The nitroglycerin was transported in wagons or sleighs, across the rough mountain roads in wooden boxes, cushioned by rubber tubes and sponge. Within the tin container, a one-and-one-half inch tube gave space for the later introduction of water at 70 to 90 degrees F., ultimately to thaw out the frozen nitroglyc-

erin for the blaster. Closed by a bladder-wrapped cork, the tins of nitroglycerin were transported to the place of use — in the summer covered by a layer of ice. Incidental equipment comprised two ice plants of 400-ton capacity; a 15-horsepower boiler; and a 10-horsepower engine to pump water into the washing tanks, to operate the two blowers, and to give power to the gutta-percha factory.

So greatly did the tunnel executives distrust the insulated wire of the period that they insulated their own conductors at the site. The details of their methods need not be listed. Briefly, their imported gutta-percha blocks were rasped into pieces, which passed through a trough of water in which the impurities settled, were steamed, masticated and rolled; pressed through gauze and masticated again to make the gutta-percha pure. Gutta-percha, at "95-tons pressure," was forced against the five parallel wires that led through oversized slots, through which the wire to be insulated passed. For some reason, the "lead" wires were given a heavier insulation coating than the "return" wires, perhaps indicating the state of knowledge of electrical engineering in this period.

Great precision was required in the manufacture of the myriad exploders, also made on the site. They were tiny affairs, about one-half inch in diameter, by one and one-half inches in length, to activate which an electric spark would ignite the primer (a mixture of sulphide and phosphide of copper with chlorate of potash) which would set off the fuse (fulminate of mercury in a copper cap) which in turn would detonate the nitroglycerin cartridge into which the exploder was ultimately inserted.

Electricity to set off a blast was supplied by a modified Austrian or frictional plate machine. When in good order this machine would fire 20 to 30 holes, using lead wires 500 feet long. The hazards of misfires caused by the rapid deterioration of the initial machines caused Mowbray to redesign a more rugged type, with a cylindrical exciting surface, enlarged condensing surface, and a ground connection.

Much of the aboveground works at the Hoosac Tunnel are thus seen to have been for the manufacture of nitroglycerin, insulated wire, and detonators, which today would be delivered ready-made to the job.

If danger lurked in the aboveground works of the tunnel, it was a definitely more threatening danger underground. Two miles from daylight, with glimmering candles and flaring lamps, crowded miners worked with steel picks and drills, dodged spoil cars, and, somehow got used to the din of air drills and compressed-air exhausts, all in the wet drip of condensation and leaking seams. Mysterious death lay in wait during the period of learning the rules of safety in the handling of nitroglycerin. Later, death would come to those who were careless in obeying the rules which Mowbray laid down. One must never expose a cartridge to a sudden jar. He should never drill in spots where liquid nitroglycerin had been spilled, but should fire an exploder to clear it up. He should never pour liquid nitroglycerin into a seamy hole, but should use a cartridge. After a blast, he must look for unexploded cartridges. Under no circumstances should he attempt to tamp a drill hole. He should know that

*(Continued on page 164)*

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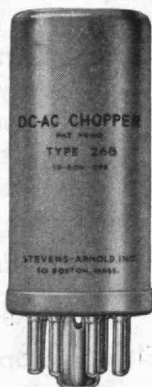
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## THE BLASTED BORE

(Continued from page 163)

blasts of compressed air could generate static electricity which could cause premature explosions, unless extreme care were taken in wiring the exploders at the cartridges. But the initial prejudice of the Irish and Cornish miners against nitroglycerin ultimately changed to a greater dislike for the noxious fumed gunpowder, and they threatened to strike when it was proposed to deprive them of nitroglycerin for a month, in order to carry on a comparative test with gunpowder. It was the lesser of two evils, and, as good construction men, they rejoiced at the records of progress they were breaking with its use.

The order of work at the west end was as follows: In a period of six hours, 11 holes were first drilled to embrace an area about nine feet wide near the roof. On signal, the cartridges were brought in one vessel — the exploders coming in a separate vessel. The miners were next dismissed, drill holes gauged, and exploders attached to the cartridges which were then immediately pressed into the drill holes. With the holes plugged with a bung and the connections made, the operator retired about 300 feet to a "break" (home-made switch?), where the connections were made to the wires leading to the friction machine, some distance away. After blasting these first holes and after removal of the rock, the drill carriage was advanced and the heading was widened by a second blast of some 14 holes. A third blast of 15 holes completed the heading, advancing it by about seven feet, six inches. At this stage, the heading was nine feet high by the full tunnel width of 24 feet. Simultaneously with the heading work, at about 500 feet to the rear, a gang worked at the bench and, by a third gang farther back, the bench was completed, and the tunnel finished: 24 feet wide by 22 feet high. An adit for drainage was then made in the tunnel floor. Differing from the above-described west end method, the east end was worked by a heading that commenced at roadbed grade, two stopes then being taken from the roof.

With the work progressing from four faces (west end, east end, central shaft toward west, central shaft toward east) eight gangs of 16 men each worked in eight-hour shifts. Other workers made a total payroll of about 900, among the listed employees being plate-layers, rock men, cage and locomotive engineers, blast-ers, dumpers, blacksmiths, machinists, timekeepers, and supervisory talent. The monthly payroll varied from \$40,000 to \$60,000, to which the item of supplies had to be added.

On Thanksgiving Day, November 27, 1873, success came to the well-planned program of the tunnel engineers and George M. Mowbray, chemist, vigorously carried on by the contracting firm of Walter and Francis Shanly. With the west central shaft heading meeting that from the west portal, there was a clear path through the mountain. In about five years this team had opened 63 per cent of the tunnel. It had taken 17 years to open the other 37 per cent, since the token start of 1851, made in an atmosphere of strong doubt whether the tunnel was at all feasible. Three years later (1876) the various finishing touches, in-

(Continued on page 166)

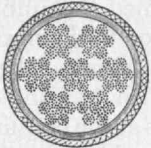
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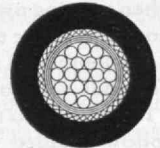
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PFGGV-600-16	.120"	15	#16	19	20	.130"	PFRWX-600-16
PFGGV-600-14	.140"	20	#14	19	27	.160"	PFRWX-600-14
PFGGV-600-12	.160"	30	#12	19	37	.225"	PFRWX-600-12
PFGGV-600-10	.190"	45	#10	104	50	.270"	PFRWX-600-10
PFGGV-600-8	.240"	75	#8	133	67	.350"	PFRWX-600-8
PFGGV-600-6	.290"	110	#6	133	91	.410"	PFRWX-600-6
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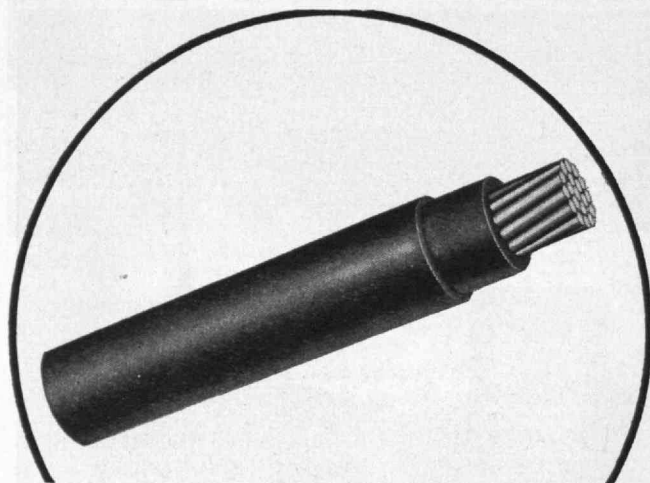
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## THE BLASTED BORE

(Continued from page 164)

cluding the laying of the first track, were finished, and, after one quarter of a century, through service to the West was scheduled, the original reason for starting the tunnel.<sup>10</sup> The Hoosac Tunnel was a going concern.

In a generation that complacently accepted high casualty lists on ventures which required the use of untried materials and dangerous methods, those who built the Hoosac Tunnel wrote their epic of construction courage.<sup>11</sup>

Their job done, those who retained the unbroken limbs needed in their trade moved on to the next construction project. And they probably showed the typical cynicism of construction men when they noted that there were only modest celebrations at the consummation of their stupendous feat of tunnel building. They probably agreed that the completion of the Pacific Railroads was worthy of the nationwide rejoicing that had occurred seven years prior to the finish of the tunnel. But the finishing of this hole in the ground that they had just completed was its own celebration, they would agree. So they would seek some other tract of the rugged bowels of good old mother earth to operate upon.

Those who paid most of the bill of about \$14,000,000 for the construction of the tunnel (the Massachusetts taxpayers who have now passed on) would agree that this investment was money well spent, considering its contribution to the prosperity of the region, as the tunnel has served as an important artery of trade with the West for three-quarters of a century. At present, about one third of a million cars bring about 20,000,000 tons of freight from the West every year and carry about 10,000,000 tons back. (Average annual amounts for the years 1940-1949, inclusive.) The sum of these tonnages, 30,000,000 per year, may be compared with the 478,606 tons of merchandise carried by the entire system of the Fitchburg Railroad Company in the year 1854, when the excavation of the tunnel had been barely started. Those who make their living today by the use of rock drills and dynamite will also admit their great debt to the tunnel builders for their pioneer work in the development of these two important agencies in the field of construction and mining. The Hoosac Tunnel has paid off handsomely.

### Epilogue

Service through the tunnel began under the Fitchburg Railroad Company which had taken over operation of the Troy and Greenfield Railroad in 1874. In the year 1919, the Fitchburg was merged with the Boston and Maine Railroad which now operates the tunnel. The Hoosac Tunnel soon became known as the worst of American railroad "smoke holes." There is the testimony of the former fireman who would bury his

<sup>10</sup> The second track was opened six years later.

<sup>11</sup> It was a period of half-guessed-at bridge designs as the new Bessemer steels were used to replace the light wooden bridges for highways and railroads; and there were many bridge failures with heavy casualties. Railroad accidents were so common that a railroad magazine carried an editorial: "The Wreck of the Month."

head in a gunny sack in the coal of the tender to keep from smothering while passing through the tunnel. There is also the tip that a trackwalker's torch would flare away from the direction of an approaching train — a train invisible because of the smoke. An approaching train was even still invisible with the advent of an electric lighting system. One recalls the assurance of the Laurie and Latrobe reports that ventilation would not be a serious problem. We must remember that these men were thinking of locomotive engines that were small, with exhaust products of combustion trivial in amount to those of a modern steam locomotive. Improvements were made at the central shaft in 1877, with a thick masonry arch to intercept falling rocks, and with some attempt to promote better ventilation. Later incidents, although of less dramatic interest compared with the struggles of those who built the tunnel, reveal the progressive determination of the Boston and Maine Railroad to keep this valuable operating unit up to date. Of less tangible value is the legendary interest which the tunnel inspires among the employees of the railroad: from president to water boy, all are proud of their Hoosac Tunnel.

In the year 1899 powerful fans<sup>12</sup> were installed at the central shaft to alleviate the smoke problem. A decade later (1910-1911) the smoke really was conquered when the tunnel was electrified, the steam

<sup>12</sup> After an operation period of nearly half a century, these fans were replaced in 1945 by two modern fans, each having a capacity of 250,000 cubic feet a minute, and capable of giving two changes of the air in the tunnel per hour.

locomotive running "deadhead." The Diesel engine supplanted the electric in 1946. There were thus about 35 years of operation of each — the steam and the electric — and five years of the Diesel in the three-quarter century of tunnel service. But the increase in the size of locomotives made it an undersized tunnel: Therefore, a tough problem of construction during operation had to be undertaken in 1925. Miraculously, while trains still ran on approximate schedule, the rock floor of the tunnel was blasted out to allow the lowering of the track to give headroom for the largest modern cars or locomotives. Surely the men of the 1870's, looking on from their vantage point in the construction man's heaven, must have applauded this modern feat of construction.

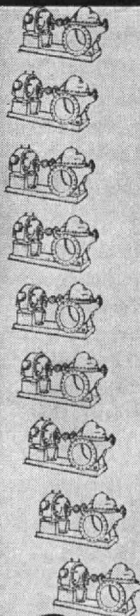
Today, one quarter of a century later still, these old-timers, returning in spirit to their tunnel, would of course come by train, for they were railroad construction men. They would be confused by many new things — poignant examples of the tremendous increase in the power, weight, and speed of railroad equipment since their day. They would stare at the huge Diesels, drawing 100 freight cars or more; and they would, of course, examine the roadbed construction and note that the steel rails were at least twice as heavy as the iron rails of the 1870's. As smart Yankee mechanics, they would be intrigued with the intricate mechanisms of the all-electric centralized traffic control board, which governs the 14-mile-long section of railroad which embraces the tunnel. They would read

(Concluded on page 168)



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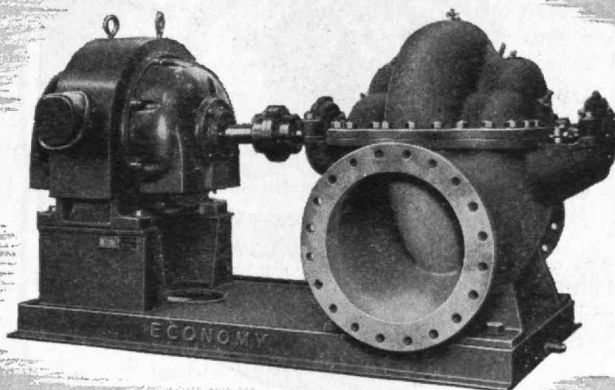
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## GEARS.

## THE BLASTED BORE

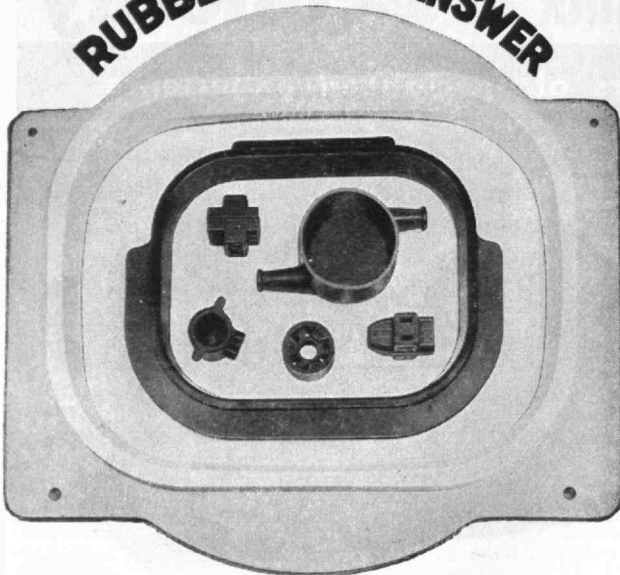
(Concluded from page 167)

the railroad posters that announce many vacation excursions. This last novelty, perhaps, would astonish an old-timer most; to learn that even working men of the mid-Twentieth Century must have their annual vacation from the arduous duties of modern life. In their day, vacations were for rich men who would go to Saratoga Springs or Bar Harbor. Locomotive engineers worked 70 hours a week in Massachusetts, at a maximum daily rate that had risen from \$2.00 in 1851, to \$3.45 in 1876, during the period of construction of the tunnel. Why should such highly paid men need a vacation?<sup>13</sup>

High above his tunnel, the returning old-timer would observe on the sharp Hairpin Bend of the vacationist's delight, the Mohawk Trail, not the elegant, six-horse coaches of his day, but smoothly swift lines of strange vehicles, which he would hear called automobiles. Via narrow and tortuous roads his guide would drive him down to the two portals of the Hoo-sac Tunnel. And the old-timer, no longer confused, would be content. It was his tunnel, looking exactly as he had left it. Barring an earthquake, it would remain undamaged for many centuries more, so well did he build, and so well had the railroad engineers who succeeded him repaired the normal ravages of time on his monument of pioneer tunnel construction.

<sup>13</sup> Today, it is not unusual for an engineer to receive \$7,000 a year based on 20 nine-hour days a month.

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## TECHNOLOGICAL CHANGE AND SOCIAL POLICY

(Continued from page 152)

communication, power, metals, textiles, agricultural machinery, building — sociologist Bernhard J. Stern reported to the National Resources Committee the following finding: "From the results of this study it is apparent that the psychological factors of habit, fear, desire for personality equilibrium and status, and the tendency of groups to coerce their members to conformity, are latent predisposing factors toward resistance to change."<sup>8</sup>

In the next place, social policy must reckon with the need for maintaining free but well-financed programs of basic research (or so-called "pure science"). This is imperative since change, in a technological culture, is absolutely dependent on the free elaboration of scientific discovery and its subsequent linkage with technical application.

How important this problem is may be suggested by two illustrations. The first is the development of atomic energy research. With the Army and the Federal Bureau of Investigation in virtual, if not actual, control of atomic energy research, uninhibited research and communication on a national, as well as international basis, have been, except in a very limited way, throttled in recent years. Says Edward U. Condon of the National Bureau of Standards: "Prominent scientists are denied the privilege of traveling abroad. Physicists are not allowed to discuss certain areas of the science with each other, even as between individuals working on closely related phases of the same subject. They can only communicate through official channels, involving censorship of their communications by Army officers without knowledge and so without competence."<sup>9</sup>

This situation is usually defended in terms of security. But the motivations which lead to a dominated and fettered science involve far more than security risks. An instructive example is the story of German science during the days of the Nazi regime. As detailed by Samuel A. Goudsmit,<sup>10</sup> the Gestapo-ridden science of Hitlerite Germany fell prey to several easily imitated mistakes. These included: (1) complacency; (2) deterioration of interest in pure science; (3) regimentation in the administrative controls over research; (4) the hero worship of individual scientists; (5) the stifling secrecy of national security measures; (6) the failure to maintain open and widely used channels of communication among scientists themselves; (7) fanatical nationalism; and (8) doctrinaire dogmatism.

On the basis of a short article, "Physics in the USSR" appearing in *Physics Today*<sup>11</sup> which is attributed to Professor D. N. Nasledov, it is possible to elaborate on the effects of physics as practiced in Russia. Nasledov's article shows that Russian natural sciences, like the Hitlerite German science, also fall prey to many errors when the state attempts to dictate thinking, and especially when it attempts to mold science according to the brew of a cauldron of political dogma. To the eight points which have been outlined for Hitlerite

(Continued on page 170)



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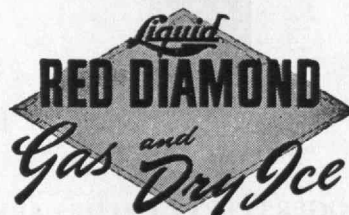
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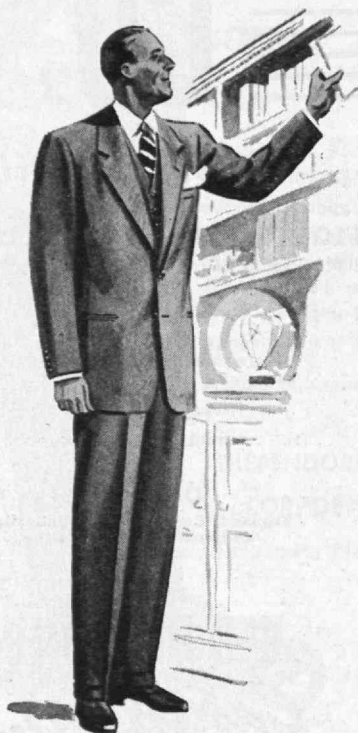
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## TECHNOLOGICAL CHANGE AND SOCIAL POLICY

*(Continued from page 169)*

German science, it is possible to add in the Russian case the additional errors of: (9) hero worship of the head of the state who, regardless of his own lack of qualifications in science, is regarded as a political law-giver with whom all science must conform; (10) employing science primarily for militaristically aggressive purposes in furtherance of nationalistic political objectives; and (11) the casting of all thought into a mold guided by party lines where objectivity has no place.

Scientific research is a type of industrial work. To put the problem of free basic research in its simplest form, social policy must find and preserve ways of protecting the workmen, of providing them with tools, of securing the conditions of their work, and of encouraging organized attacks on meaningful problems.<sup>12</sup>

Again, social policy must reckon with the difficulty or impracticability of introducing for public use certain discoveries or improvements in our way of life. This has usually been referred to as the problem of "vested interests." Accusations have frequently been made by those who understand science and technology but imperfectly that desirable inventions and products have been intentionally withheld from public use, but such contentions have not been supported.

Another interesting case in point may be taken from the housing industry. Testifying before the Temporary National Economy Committee in July, 1939, when he was assistant attorney general, Thurman W. Arnold called attention to five types of building-trade restraints.<sup>13</sup> They consisted, he found, of price fixing by producers, restraints by distributors, restrictive practices by contractors and unions, as well as by legislative bodies. The consequences include inflexible prices, imperfect competition, inhibited productivity, thwarting of technological innovations and of experimentation in design, materials, and methods in such a way as to impede production.

Housing is merely one of a multitude of instances which show how advancements in the field of applied science, or technology, have been hamstrung by restrictive practices. It is indeed a familiar story in American history. There is very little comfort in the following testimony of the Inventors' Guild: "It is a well-known fact that modern trade combinations tend strongly toward constancy of processes and products, and by their nature are opposed to new processes and new products originated by independent inventors, and hence tend to restrain competition in the development and sale of patents and patent rights; and consequently tend to discourage independent inventive thought."<sup>14</sup>

Finally, it is wise to remember that social policy, with respect to proposed or anticipated innovations and their consequences, is necessarily an unfinished — even unfinishable — business. A culture which survives by ceaseless change can hardly find refuge in static formulas of control. Social policy in the field of technological change must, moreover, not only be dynamic but integral as well. This fact forms one of the

*(Concluded on page 172)*

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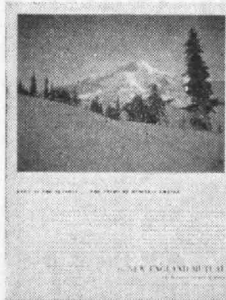
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## TECHNOLOGICAL CHANGE AND SOCIAL POLICY

(Concluded from page 170)

conclusions of a recent study of this problem sponsored by the Social Science Research Council. "The total examination of the field of technological change will require a team approach. Only by combining the work of economists, sociologists, psychologists, political scientists, and other specialists can the total cost and total effect of any given change be measured. . . . After the efforts of these specialists are combined, we will have the relevant data for the kinds of decisions that are attempted in modern social organizations."<sup>15</sup>

### REFERENCES

- <sup>1</sup> New York: Oxford University Press, 1948, \$12.50.
- <sup>2</sup> United States Department of Agriculture, *Technology on the Land*, page 5 (Washington, D.C.: United States Government Printing Office, 1940).
- <sup>3</sup> Ogburn, William F. and Nimkoff, Meyer F., *Sociology*, Chapter 24 (Boston: Houghton Mifflin Company, 1940), \$3.50.
- <sup>4</sup> United States National Resources Committee, *Technological Trends and National Policy*, Section II, pages

15 ff (Washington, D.C.: United States Government Printing Office, 1937), \$1.00.

<sup>5</sup> United States National Resources Committee, *opus cited*, Section II, page 18.

<sup>6</sup> *Technique of Social Progress*, pages 4-5 (New York: Henry Holt and Company, 1931), \$3.60.

<sup>7</sup> "Rise of Active Resistance to Social Innovation," *Bulletin of the Society for Social Research* (University of Chicago), December, 1949, page 9.

<sup>8</sup> United States National Resources Committee, *opus cited*, Section IV, page 59.

<sup>9</sup> See also Meadows, Paul, "Leagues of Frightened Men," *Prairie Schooner*, Summer, 1949, pages 75 ff.

<sup>10</sup> *Alsos* (New York: Henry Schuman, Inc., 1947), \$3.50.

<sup>11</sup> 3:30 (September, 1950).

<sup>12</sup> See also Young, Donald R., "Limiting Factors in the Development of the Social Sciences," *American Philosophical Society Proceedings*, 92:325 ff (November 12, 1948).

<sup>13</sup> "Restraints of the Building Trades," *Verbatim Record of the Temporary National Economy Committee*, pages 458 ff (Washington, D.C.: United States Government Printing Office, 1939).

<sup>14</sup> United States National Resources Committee, *opus cited*, Section IV, page 63.

<sup>15</sup> Brozen, Yale, "Social Implications of Technological Change," *Social Science Research Council Items*, 3:33-34 (September, 1949).

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## THE UNCHANGEABLE SHIP

(Concluded from page 149)

broken by the construction of Gar Wood's *Venturi* which has received considerable publicity since 1949. The ship, 188 feet long with a total width of 40 feet, was built during World War II (under the designation TA-1) as a target ship simulating an aircraft carrier for bombing practice. But it was not used and was sold back to the inventor after the war.

Reduced to minimum wordage, Wood's claim is that the older catamarans failed for two reasons: the first and most obvious one is that they were underpowered; the second is that the shape of the twin hulls was wrong. The hulls of the older catamarans could have been used as single ships, except for the fact that their keels were off-center. Wood arrived at his new hull shape by taking a conventional ship, cutting it apart lengthwise, and placing the two halves some distance apart, but *transposed*, so that the two straight sides form the outside of the whole. Experimenting with models, Wood found, however, that the ship would travel on a straight course only if he did not round off the stern a little.

The *Venturi* has made trial runs off Miami in 1949, and attained 26 knots, virtually without rolling, even when a heavy sea was running. She is also reported to turn with a radius four times her own length. It is only natural that the inventor loves his invention and predicts a great future in which twin-hulled superliners for 4,000 passengers will attain an average speed of 36 knots. Well, it may be that the different hull shape actually makes all the difference. If so, it would be the first major change of the ship shape since its invention; a real change, not just an improvement. If this particular change wins out, it should be soon enough so that most of us will still be alive to see the day. In the meantime, it is useful to keep in mind how unchangeable the ship has proved to be in the past.

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# Alumni AND Officers IN THE News

## Awards

The David W. Taylor Medal for achievement in naval architecture was awarded to HAROLD E. SAUNDERS'16 at the annual banquet of the Society of Naval Architects and Marine Engineers on November 10.

"For his many contributions to both theory and practice in the fields of thermodynamics, distillation, and gas separation; especially for his work on the reactions of gases under pressure, which led to the principal process for the separation of butadiene in the manufacture of synthetic rubber," EDWIN R. GILLILAND '33 received the American Institute of Chemical Engineers' 1950 Professional Progress Award. In presenting Professor Gilliland for the award, THOMAS K. SHERWOOD'24 stated that the purpose of the award is to recognize a man under 45 years of age who has made a distinguished contribution to chemical engineering. We note in looking over Professor Gilliland's impressive professional record that he is one of the six chemical engineers among the 480 members of the National Academy of Sciences.

ALAN B. MACNEE'42 will receive the Browder J. Thompson Prize for his paper, "An Electronic Differential Analyzer," which appeared in the November, 1949, issue of the *Proceedings of the I.R.E.* The award, which will be presented at the Institute of Radio Engineers' annual banquet on March 21, is given to the author under 30 years of age "for that paper recently published by the Institute which constitutes the best combination of technical contribution to the field of radio and electronics and presentation of the subject."

EARLE BUCKINGHAM, staff, was the recipient of the Edward P. Connell award of the American Gear Manufacturers Association, "for his services to the gear industry as teacher, student and author."

## The A.P.H.A.

The following Alumni gathered in St. Louis on November 1 for an M.I.T. Breakfast in connection with the 78th annual meeting of the American Public Health Association: CHARLES-EDWARD A. WINSLOW'98, MRS. CHARLES-EDWARD A. WINSLOW'04, FRANK J. OSBORNE'12, ELLIS S. TISDALE'15, CLAIR E. TURNER'17, WILLIAM W. PETER'18, EUGENE S. CLARK'20, MRS. CLAIR E. TURNER'26, MORRIS F. SHAFFER'30, FREDERIC W. NORDSIEK'31, FREDERICK F. ALDRIDGE'33, MARIA BATES CARPENTER'33, VIVIAN V. DRENCKHAHN'33, SAMUEL H. HOPPER'33, MURIEL BLISS WILBUR'33, B. RUSSELL FRANKLIN'34, EDGAR J. STAFF'35, HOWARD E. LIND'37, JEROME B. TRICHTER'37, EDWARD M. BROOKS'39, LEON P. EISMAN'40, PASQUALE J. PESARE'40, RICHARD

J. HAMMERSTROM'42, SOLOMON S. LIFSON'43, MARJORIE K. SMITH'43, LEO CRAVITZ'44, and WARREN H. SOUTHWORTH'44. MURRAY P. HORWOOD'16 presided.

## Elections

THOMAS C. DESMOND'09 has been elected president of Phi Beta Kappa Associates for 1950-1951. Senator Desmond is also currently serving as one of the 24 senators of the United Chapters of Phi Beta Kappa and as president of the Phi Beta Kappa alumni in New York.

The governors of the Imperial College of Science and Technology, London, England, have elected JEROME C. HUNSAKER'12 an honorary fellow of the college with a citation including reference to "the leading part taken by Professor Hunsaker in the establishment of the friendly alliance between the Massachusetts Institute of Technology and the Imperial College of Science and Technology."

HAMILTON MERRILL'12 has been promoted to the presidency of Manning, Maxwell and Moore, Inc.

GEORGE J. MEYERS, JR., '29 was elected to the position of executive vice-president of the Reading Tube Corporation.

DELBERT L. RHIND, staff, has been elected president of the Eastern Association of College and University Business Officers.

## Miscellany

EARLE B. PHELPS'99 is the author of *Public Health Engineering*, Volume II, which was published in November by John Wiley and Sons, Inc. Professor Phelps' book illustrates those principles of sanitation that apply to the production, handling and distribution of food.

MYRON H. CLARK'03 was the principal speaker at the November 30 meeting of the New Haven, Conn., chapter of the Society for the Advancement of Management. Mr. Clark spoke on "Women's Contribution to Management."

J. NEWELL STEPHENSON'90 is the editor-in-chief of *Pulp and Paper Manufacture*, "Volume I, The Preparation and Treatment of Wood Pulp," published by the McGraw-Hill Book Company, Inc.

ISIDOR RICHMOND'16 was chairman of the "Rotch in Retrospect" exhibit held for two weeks, beginning December 13, in Boston. The exhibit included the work in models, photographs and drawings of Rotch Traveling Scholarship winners through the years. Mr. Richmond won the Rotch scholarship in 1923. His partner, CARNEY GOLDBERG'28 was the 1931 winner.

EDWARD L. BOWLES'22 was in the Japan-Korea area for approximately a month this past fall serving the Weapons Systems Evaluation Group as scientific warfare adviser.

ALFRED E. PERLMAN'23 wrote "Notes on South Korean Railroads" for the November 25 issue of *Railway Age*.

KENNETH E. WISCHMEYER'31 gave the principal address at the November 3 dinner which climaxed the convention of the Texas Society of Architects held in Dallas.

The November 27 issue of *Time* magazine contained an interesting article concerning NORBERT WIENER, staff, and his predicted "cybernetic revolution."

## Obituary

ANDREW G. PIERCE, JR., '85, November 19.\*

CHARLES H. CLARK'91, November 8.\*

E. EDWARD WINKLEY'91, February 14, 1949.

WILLIAM C. MESERVE'92, November 2.\*

HERBERT W. ALDEN'93, November 10.

LEE PORTER'94, in November, 1947.

ROBERT L. FULLER'96, October 18.\*

FRANCIS R. PEABODY'96, October 24.

NORMAN F. RUTHERFORD'96, September 26.\*

DAVID E. GRAY'99, June 14.\*

CLANCEY M. LEWIS'99, May 17.\*

W. HARRY MANDEVILLE'99, December 18, 1949.\*

ELISHA WALKER'02, November 9.

GEORGE P. CARMICHAEL'03, July 20.\*

WILLIAM M. CLARK'03, August 20.\*

FREDERICK W. GARBER'03, August 7.\*

ROBERT G. LIVERMORE'03, September 20.\*

HERBERT L. FLETCHER'07, November 10.\*

PRESCOTT R. NICHOLS'07, June 27.\*

WALDO F. DAVIS'08, February 28.\*

CLIFFORD L. WADE'08, June 23.\*

DELOS G. HAYNES'09, September 22.\*

WALTER G. HAUSER'14, October 28.\*

MELVILLE F. COOLBAUGH'15, September 9.\*

D. PORTER SPENCER'15, June 12.\*

WALTER H. FOWLE'16, November 1.\*

HAROLD E. MORSE'17, October 22.\*

GARLAND LUFKIN'18, October 23.\*

EDWARD H. ZEITFUCHS'18, November 3.

JAMES B. LEARY'20, May 9.\*

SAMPSON BROWN'21, October 7.\*

LYLE A. CLOUGH'24, in October, 1950.\*

GEORGE E. LAMB'24, September 27.\*

LAURISTON E. CLARK'25, July 9.\*

HENRY GITTERMAN'28, November 12.

PAUL E. B. WIDENHORN'31, legally declared dead.

ALEJANDRO MELCHOR'41, in 1947.\*

OTTO E. WEILHAMER, JR., 6-45, August 25.\*

THOMAS C. MAIN, 2-46, March 14.

FREDERICK S. WOODS, former staff, December 1.

HENRY JACKSON WARREN, former staff, in November.

\*Mentioned in class notes.



# News FROM THE Clubs AND Classes

## CLUB NOTES

### *M.I.T. Club of Central New York*

The Club opened its fall season with a dinner meeting held at the University Club of Syracuse. Following the dinner, a short business meeting was held with Vice-president Frederick Hodgdon'42 presiding, in place of President Harold Gray'16 who was unable to attend. At this meeting, election of officers for the 1950-1951 year was held. The following were elected: President, Luke S. Hayden'41; Vice-president, Jack L. Schultz'42; and Secretary-Treasurer, Robert L. Wooley'41.

At this initial meeting of the 1950-1951 season, Donald P. Severance'38, Secretary-Treasurer of the M.I.T. Alumni Association, who was the guest speaker of the evening, presented a talk on recent research projects and other developments at the Institute. His explanation of the work currently being carried on at the Institute in low temperature research, nuclear engineering and supersonics proved to be of special interest.

Among those present at this meeting were: Walter E. Hopton'91, Frederick W. Barker'12, J. Harold Kaiser'19, Franklin J. Sawyer'24, Theodore E. Simonton'24, Donald W. Diefendorf'30, Charles D. Luke'31, Richard Henderson'38, David E. MacLeod'38, Joseph F. Owens, Jr.'40, Luke S. Hayden'41, Robert L. Wooley'41, Frederick S. Hodgdon'42, Carl O. Wood'42, John L. Cowan'47, John W. Maney'47, Richard J. Nickerson'49, Edward R. Orear'49 and Robert K. Peterson'49. — LUKE S. HAYDEN'41, *Secretary*, 417 West Beard Avenue, Syracuse 5, N.Y.

### *The M.I.T. Club of Chicago*

It was "Up and Down the Monon" for 108 Alumni, wives, and friends over the week end of October 27-29. The destination was French Lick in the Hoosier State of Indiana for sports, card games, scenic side trips, sociability, and just plain loafing, to say nothing of good food. And everybody had a good time. Credit for the French Lick idea and planning goes to John Barriger'21 (Monon top boss), to his charming wife, Elizabeth, and to the Monon staff. This is the second time we have taken the French Lick trip, and several of our group were on the pilgrimage last year.

We left Chicago Friday noon. Although some of us had not met before, we got acquainted rapidly, aided by name badges decorated with cardinal and gray ribbons and by the handsome Monon souvenir menu that listed all members of the party. Class representation ran all the way from the Samuel T. Smetters'96 to Ralph P.

Gates'49. We enjoyed the ride over the much improved Monon roadbed (since John B. took command in 1946), and, as we glided along, Stanley Barriger called our attention to various points of interest, including scenery and railroad construction. There was a railroad laboratory exercise, an optional course for venturesome souls who took turns riding in the Diesel locomotive cab, and you will recall that the Monon was the first line in the United States to be 100 per cent dieselized.

Both lunch and dinner were served aboard the train, and we reached French Lick in the early evening. On the trip down, the Harold Howes, of M.I.T. Development Program fame for the Middle West, established "The Old Gray Mare" as theme song for the trip. Also, Bob Wise'28 and the Secretary each wore out a pair of shoes walking through the train to take the official census preparatory to arranging activities at French Lick. After arrival at French Lick Friday evening, some of the folks took to dancing, some sat on the porch, others ventured out into the hotel gardens in search of Pluto's famous sulphur water springs, and still others organized impromptu card games or invaded the bowling alleys. After breakfast Saturday morning, each member of our group was presented with a Monon visor cap. Then some 20 men and wives took to the golf course. Golf activities were under the able management of Bob Wise'28. Honors went to Bob Guinness'34 who had a beautiful 78 on the tough hill course. Mrs. G. also shot a nice game. Other better-than-average scores were made by Bob Wilson'16, Lou Jacoby'09, Ben Sherman'19 and his guest Jack Nylund, Ralph Gates'49, and possibly others who were too modest to indicate their success. Others seen on the golf course included Walter Bagby'24, the Dan Barnards'21, R. D. Cooper'21, James Ferrall'17, Harold Ford'29 and his guest John Haugan, the M. T. Carpenters of Standard Oil and guests of Bob Guinness, Warren Knauer'43, Richard Morris'21, J. R. Norton'22, and the John L. Salmons'39. Some of the nongolfers joined the Stan Humphreys'28, who organized saddle trips over the neighboring bridle paths and trails.

Also on Saturday morning, approximately 50 of our group took the motor trip to Spring Mill State Park, a scenic spot in the southern Indiana hills and the site of an old grist mill, where many in the party purchased fresh cornmeal in sacks. Among those seen on the Spring Mill trip and not mentioned elsewhere in this account were the George H. Minchins of Santa Fe and guests of John Barriger, the Levi S. Browns'33 and daughter Doris, the Clarence Clarks'08, Mrs. Rose Brock, guest of Wilfred and Mrs. Jones'31, the J. M. Fitzgeralds'02, William Osgood'19, Betty Barriger, daughter of John B., the Karl Ottes'28, the A. T. Scannells'08 and daughter Ann, the John Primiches, the

Hoy Cranstons and the J. W. Hoppes — guests of Dutch Seifert'19, the W. D. Shepards'20, the Ben Shermans'19 and their guests the Jack Nylunds and Harold Howes, and Lou Sheldon'25.

Saturday noon all gathered for a barbecue steak lunch at the hill golf course clubhouse, and boy, was it good! It was here that Bob Wilson'16, chairman of our card committee, observed that a high percentage of our card enthusiasts had expressed a preference for bridge as against canasta and thus had demonstrated their intelligence. Accordingly, he announced that evening bridge would be in the spacious sun porch of the hotel, and canasta in the basement.

Saturday afternoon there was another trip to Spring Mill for those not going in the morning, so that they, too, might have an opportunity to get cornmeal and an eyeful of scenery. A few folks returned to the golf course. Others went in for the famous French Lick Springs bath treatments, swimming, walks, and rocking chairs. We were especially glad to see our old friends the Ed Farrands'21 with us, and to welcome the Phil Cristals'17 of Milwaukee. The Dick Meyers'42 joined us Saturday evening at French Lick while en route from Sea Island, Ga.

Saturday night we were the guests of the Barrigers for cocktails aboard the Monon Official Car Number 1, located on the siding near the hotel. Dinner was served in one of the hotel's private dining rooms. Following some announcements after dinner as to Sunday plans, Mrs. Lee Ford, attractive wife of Harold E. Ford'29, on behalf of the entire group presented Elizabeth and John Barriger with a \$100 Marshall Field merchandise certificate in recognition of their matchless hospitality throughout the trip. A brand new Monon movie next entertained us for half an hour, showing the fine art of railroading and some of the history and commercial geography of Indiana. Then card games got under way. Bob Wilson relented and did not require the canasta folks to play in the basement after all. Among the bridge players were the Walter Bagbys'24, the Dan Barnards'21, the Gus Bouscarens'04, the Clarence Clarks'08, Lou Jacoby'09, the Raymond Kochs'41, the Lester Kornbliths'38, the Charles Moores'22, Barrett Russell'43, the Elmer Szantays'35, George and Mrs. Wallis'09, and the E. L. Woodward's'11, and numerous others. Some took to the porch, danced, or went walking.

Sunday morning by special arrangement many attended church at the Jesuit College in neighboring West Baden, and others with energy and enthusiasm rose early to play golf or ride horseback before train time at 10:45. One of these energetic souls was Lou Jacoby'09 who, like the famous bear who went over the mountain, was climbing the hill back of the hotel when the warning whistle on

the train blew, and, remembering the announcement concerning stragglers being left behind, he broke all cross country records and came crashing down the trail to be the last one aboard.

On the return trip we had Sunday dinner and afternoon tea on the train. By that time we were all pretty well acquainted, and it developed that of the couples aboard only the Bouscarens'04 and the Szantays'35 had as many as five children each, but the Dutch Seiferts'19 were the only ones to claim as many as three dogs. We also learned that a number of our party had taken the trip in celebration of a birthday or wedding anniversary occurring either late in October or early November. Birthdays included those of Wilfred Jones'31, Robert Peach'47, John Reddersen'47, Nancy Norton (daughter of the J. R. Nortons'22), and possibly others who did not confess to it, although ages were not asked. The folks celebrating anniversaries included the Charles G. Moores'22, the W. D. Shepards'20 (who had spent their honeymoon at French Lick), the James P. Ferralls'17, the Saul A. Hoffmans'16 (their daughter Marilyn age five and one-half was also in the party). The Earle Langelands'31 were celebrating the anniversary of their first meeting which had occurred on a New York, New Haven and Hartford train, but as to railroads, they express now a preference for the Monon. It was a well behaved, congenial group throughout the trip, and we all were impressed with the ability of John Barriger to provide so much for so little. — PHILIP L. COLEMAN'23, *Secretary*, 208 South La Salle Street, Chicago 4, Ill.

### ***M.I.T. Club of Milwaukee***

The Club had one of its most successful dinner meetings on October 24 at the University Club in Milwaukee, with some 50 members present. As a part of the evening's business, Harold Koch'22, incumbent president, called for the election of officers for the 1950-1951 season, with the result that a white ballot was cast for the following officers, as recommended by the club's nominating committee: President, Arthur Hall'25; Vice-president, Michael Biancardi'40; Secretary, Emerson Van Patten'24; Treasurer, Chester Meyer'36; Directors-at-large, Fred Gruner'41 and William Peirce'46.

The club's new president, Arthur Hall, was called on then for a few remarks, and briefly outlined his desire to make the Club and its activities conform to the members' wishes as to number of meetings, type of speakers, and so on. He mentioned that the traditional luncheon for M.I.T. undergraduates in the Milwaukee area would be held during the Christmas holidays, and that the evening meeting for local high school faculty and student members would be reserved for one of the spring meetings.

Harold Howe of Marts and Lundy was introduced and in a few words reviewed the status of the M.I.T. Development Program, pointing out how Technology men all over the country had lent every effort in the hope of making the ultimate goal a reality. In this connection, Mike Biancardi asked that his committee re-

main after the meeting to discuss final plans for completing the club's activity in this regard. C. Richard Soderberg, Head of the Department of Mechanical Engineering at M.I.T., was our guest speaker; and after touching on his recent trip to Germany, entered into the main topic of discussion — his interpretation of the findings of the Committee on Educational Survey together with the growth and changes occurring at the Institute from its inception up to the present time.

Our meeting was enhanced by the presence of one of our coeds, Mrs. Anthony Chappelle (Georgette Meyer'40) and her husband, now residing in New York and recently returned from Europe where they had been engaged for some time in taking movies on both sides of the Iron Curtain. Carl Kohler'28 had driven in from Kohler, Wis., and both Fred Port'40 and Bruno Werra'32 had journeyed to our meeting from Waukesha, Wis., to make us feel that the Club is really broadening in its scope.

Others in attendance were: M. P. Allen'13, R. A. Arrison, Jr.'49, Jack Ballard'35, Edwin Bartlett'06, W. R. Bohlman'49, Walter Bonns'99, Stanley Bragdon'20, Frank Briber'43, G. F. M. Chase'38, Jonathan Cobb'37, Phil Cristal'17, John Douglas'05, Frank Hamilton'07, Charles Hazard'47, Ralph Hille'44, D. W. Hoffman'47, Theodore Hogg'47, C. W. Jackson'49, A. E. Jakel'44, Maurice James'27, Philip Koehring'49, Joseph Kripke'40, Burt Mendlin'49, B. J. Milleville'47, Jan Peyrot'49, Gordon Phillips'49, John Rau'49, Win Russell'26, William Schield'46, John Schmitz'49, David Smith'31, L. D. Smith'06, Charles Sollenberger'44, Alvin Steinmayer'47, Harry Valiquet'03, Emerson Van Patten'24, Milton Vogel'47, Stuart C. Westerfeld'31 and W. Olmstead Wright'34.

Our next meeting will review and try to reflect the desires of the club's membership as indicated on a questionnaire passed out at this meeting. — EMERSON J. VAN PATTEN'24, *Secretary*, 6160 North Kent Avenue, Whitefish Bay, Wis.

### ***M.I.T. Club of Northern New Jersey***

The opening gun of the 1950-1951 season of our Club was fired at the Hotel Suburban, East Orange, on November 15, with the annual smoker and fall get-together. The meeting was attended by approximately 70 Alumni, all of whom seemed to enjoy the program and refreshments. The emphasis this year was on sports, and the program was designed to appeal to the sports-minded. Following the calling of the meeting to order by President Lem Tremaine'23, the club officers were introduced and the treasurer's report read. Then Lem turned the meeting over to Fred Strassner'38, program committee chairman, who introduced the principal speaker, Jim McMillin, coach of the Technology crew. Jim gave us a brief word-picture of the sports program at the Institute, then entertained us with colored movies of the crew in action. A high-light of these movies was a sequence showing the M.I.T. "heavies" winning the Eastern Intercollegiate Regatta at Annapolis last

spring. Next, Fred introduced Hugh Devore, New York University football coach, and a former Notre Dame star. Hugh generously consented to tell us a little about intercollegiate football and about his own coaching experiences. Lem then adjourned the meeting for refreshments and camaraderie. The Program and House Committees deserve a big hand for the evening's arrangements.

The next club meeting is scheduled for the middle of January. Fred Strassner has not yet announced the program, but if past performance is any criterion, it will be good. In the meantime, the Directory Committee, headed by August Munning'22, is readying the publication of a new directory of Northern New Jersey Alumni. — ALBERT C. FAATZ, JR.'37, *Secretary*, 22 Midland Boulevard, Maplewood, N.J.

### ***M.I.T. Club of Schenectady***

The Club at this writing finds itself reporting two monthly meetings — the very successful luncheon meeting at Ferro's Restaurant, and on November 20 the first dinner meeting of the 1950-1951 season. Fred Barrett'34 presided at the latter meeting held at the Edison Club Pine Room in Rexford, N.Y. We were honored at that time to have Harold L. Hazen'24, Head of the Department of Electrical Engineering at M.I.T., as our guest speaker. Donald P. Severance'38, Secretary-Treasurer, and H. E. Lobdell'17, Executive Vice-president of the Alumni Association, were our guests that evening. There was a goodly turnout of Alumni, their wives and friends.

The various committees of the Club have been quite active and busily engaged these past few months. The Counseling Committee, in particular, under the chairmanship of Holton E. Harris'44, has been assembling listings of Alumni in the area for contact work with new arrivals from M.I.T. In addition, this committee has already made welcome several recent graduates of the Class of 1950 who have been employed by the General Electric Company. It is the purpose of this committee to work with the personnel division of the company toward making new Alumni in this area feel at home and among friends. They have been doing an excellent job in a very worth-while undertaking.

The Civic Projects Committee has also begun to function under the cochairmanship of W. B. Rodemann'44 and Ed Lawrence'47. Once again education in Schenectady primary and secondary schools is to be the object of major effort. The committee, consisting of Jim Acker'38, Lou F. Coffin'49 and Werner Bachli'33, is working with the Schenectady Chamber of Commerce to survey the means and methods by which two new elementary schools and a comprehensive high school can be provided to ease the expected overcrowding in the city school system. It is estimated that in the next five years this situation can become acute unless new facilities are added.

The Scholarship Committee under Chairman C. F. Barrett, Jr.'34 has been in contact with Dr. Harry J. Linton, superintendent of schools of Schenectady



to lay down plans for meeting with high school seniors who are interested in a technical education and who are applying to M.I.T. It is the purpose of this committee to acquaint these applicants with the Institute in an unofficial capacity and to answer any questions they may have concerning life at Technology.

We will continue to report the activities of the Club's committees from time to time. — E. S. LAWRENCE, *Secretary*, Building 99, General Electric Company, Schenectady, N.Y.

### **M.I.T. Club of Southern California**

Strauss'38, active in the directory work and other activities, has ceased being a wage slave and has started a consulting office in mechanical engineering at 1201 Rio Vista. — *Fortnight*, a new magazine dealing with all phases of California affairs, showed Banks'22 in the November 15 issue. He was recently installed as president of the Southern California Gas Company. The article is most interesting as an indication that a corporation can have a human side. The same issue devotes several pages to a history of the Union Oil Company of which Stewart'23 is vice-president.

Mr. Manley, manager of the Development Campaign in this area, stayed with us a week in early November to start the contacting of 300 Alumni who were missed in the campaign of which Stewart'23 was chairman. He stated that the goal set for California would soon be reached if a few large gifts, or many smaller ones, were made within the next two months.

By the time this is read, another meeting will have taken place with an election of officers. The Club has had very good meetings the past two years — the attendance averaging approximately 50 per cent more, but the number of meetings is less than in previous years. Because the meetings of the Club are too unwieldy for any long discussions, attention has been given to placing the problem of securing speakers of good caliber in the hands of an executive committee.

The directory has been benefited lately by the active work on advertisements of Cunningham'27 and should be on the press about the time this is read. The cash balance for this purpose is satisfactory but there should be 20 more of the \$5 personal and professional cards of Alumni. Row'23, in spite of trouble with his eyes, keeping him in a dark room, has secured advertisements and cards by telephone. It is this kind of spirit that encourages others. The general cash balance from dues and gifts is very good. The records of the Alumni show their activities, so the machinery is in shape for the new managers to go ahead. — HIRAM E. BEEBE'10, *Secretary*, 1847 North Wilcox Avenue, Hollywood 28, Calif.

### **Washington Society of the M.I.T.**

The Club held its first meeting of the 1950-1951 season on October 12 at the Washington Hotel. This was a joint meeting with the Washington area Development Committee. President Killian was the guest speaker and it was the first op-

portunity for the Washington Alumni to meet the Institute's president. A buffet supper was served which enabled everyone to renew old acquaintances and meet the many Alumni who were attending for the first time. There were approximately 250 Alumni and wives present.

Robert Thulman'22, Club President, opened the meeting and introduced Tom Meloy'17, general chairman of the Washington area Development Committee. Mr. Meloy explained the organization of the Development Committee and reported on the progress of the local campaign to date and what we hope to accomplish in the future. He introduced the Honorable Proctor Dougherty'97 and Rear Admiral J. A. Furer'05, the honorary chairmen, who offered a few remarks concerning the campaign.

Dr. Killian spoke of the aims of the development drive, the uses for the additional funds, and the results of the recent "Educational Survey." This last point was received with enthusiasm by all. Promotion of the humanities at the Institute is a subject of particular interest to all Alumni. After the showing of the "Mid-Century" movie, Ralph Jope'28 concluded the meeting with some excellent anecdotes on his "experiences in giving" which have occurred in the present fund-raising drive.

The second meeting of the Club was held at the Willard Hotel on November 9. Henry Loomis, personal assistant to the chairman of the Research and Development Board, National Military Establishment, was the guest speaker. Mr. Loomis served from 1947 to 1950 as administrative assistant to the president at the Institute. He also has held the position of special assistant to the director, Radiation Laboratory, University of California. He spoke on "Practical Applications of Military Research."

Mr. Loomis' talk was a serious exposition of the problems, and particularly the decisions, which face the Research and Development Board. If the kind of war which we may face could be determined, problems of mobilization of industry and manpower, particularly scientific manpower, would be relatively simple. But the kind of war which might explode at any moment is neither our guess nor our choice. The problems are, to say the least, complicated. Mr. Loomis discussed several probabilities, among them the "A" bomb, guided missiles and, most sobering of all, bacteriological warfare. The latter would seem to be the most attractive to any enemy with comparatively limited resources and with a fanatic and unscrupulous purpose. A lively discussion followed Mr. Loomis' talk during which some proposals to combat the many faceted menace with which we are confronted were discussed.

Our next meeting was held as usual on the second Thursday of the month, December 14. All Alumni in the area were cordially invited to attend. — FRANK S. POHANKA, JR.'44, *Review Secretary*, Route 1, Paint Branch Farms, Silver Spring, Md.

### **M.I.T. Club of Western Maine**

The Secretary of your Club would very much appreciate hearing from any

Alumni in the Western Maine area who think a winter meeting would be in order and who will support it with their presence. While we have had few meetings where those attending were not, in general, pleased with the results, it has been extremely difficult to plan events and has too often placed an undue burden upon your Secretary. Meetings have been held in Augusta, Portland, and Brunswick in the past several years and it seems that Brunswick has always turned out the greatest and the most representative number; but the locale of the next meeting can be arranged to suit the demand. Your Secretary is farther from reasonable telephoning distance to Portland than ever before, being now located in Cornish, Maine, and cannot get to Portland during business hours to call you to ascertain your wishes — so please write if you are interested in having a winter meeting arranged.

Technology was well represented at the Cornish High School during the week of Columbus Day when Orville Denison'11 entertained the pupils of the junior-senior high, of which your Secretary is now principal, with one of his fine musical programs. Dennie was in his usual form and his program was well received by students and faculty alike.

It occurs to your Secretary that there are a goodly number of Alumni in the area of Western York, Cumberland and Oxford counties; and he accordingly suggests if any in this area would like to have a regular time for informal get-togethers, the third Sunday of the month at the New Lincoln Hotel in Cornish, where the proprietor always has a good Sunday repast on hand, might be a suitable time and place. If any of you are interested, we'll set aside the hour from 12:30 to 1:30 P.M. as a time to foregather at ye Secretary's residence on Route 5, where there will be a stein on the table and an opportunity to join in a round of singing "Sons of M.I.T." That's the third Sunday of the month at 12:30 to 1:30; and plan to partake of mine host Jack's soup about 2:00 P.M. Bring the ladies! — STANLEY W. HYDE'17, *Secretary*, Box 35, Cornish, Maine.

## **CLASS NOTES**

### **• 1885 •**

Andrew G. Pierce, Jr., one of our prominent classmates, died on November 19, 1950, at his home in New Bedford, Mass. He was one of the foremost in the development of that great textile center. He graduated from the New Bedford High School, then took a special course for one year at Technology in Boston. He started in the textile industry as a clerk in the Wamsutta Mills and advanced through the ranks to spinning room overseer and assistant superintendent.

He became president of the American Woolen Company in 1925 after more than 20 years as vice-president and a director. He retired in 1930 but continued as chairman of the board of directors for two years. He was the retired president of the

American Woolen Company, the Pairpoint Corporation of New Bedford, Pierce Brothers Manufacturing Company and the Consolidated Textile Corporation of New York.

He was a former director of the First National Bank of Boston and also of the First National Bank of New Bedford. He was twice elected to the City Council of New Bedford. "Mr. Pierce was known among the councilmen as one of its amicable members. He was most agreeable in all his dealings, considered the city business with care and his judgment was most sane." — ARTHUR K. HUNT, *Secretary*, Longwood Towers, Brookline 46, Mass.

## • 1886 •

So much time elapses between the writing and the publication of the class notes that conditions reported by the Secretary as current when he turns in the notes may be very much in the forgotten past when read! Still, the delay is apparently unavoidable and we poor scribblers must do the best we can under the circumstances. On October 30, the Secretary attended the first Council meeting of the Alumni for 1950-1951 and listened to reports of the officers covering the accomplishments of the organization for the preceding year. As it is, he cannot call '86's attention to the outstanding points brought out in said reports until some time in January unless he writes personal letters or a mimeographed duplication to be sent to the Class by mail.

Ah, there's the rub! No money to pay for the postage and copying unless the "plaintive appeal" published in the November Review awakens some slumbering consciences. Again, he cannot report how many of the aforesaid consciences have responded to said "P.A." until 1951. But stay! What have we here? A letter from Ingalls enclosing his check for \$5. That means A.T.C. must ante up \$10, according to his promise and lo, the treasury has \$18 as of November 14 (provided Ingalls' check is good!) and can pay its outstanding bills. By the time this gets around in January, others may have responded before learning that we have funds on hand. There's a thought! Perhaps the delay between the aforesaid receipts and their publication in January may prevent some members (heaven forbid) holding out on their contributions knowing the treasury is in funds. So that cloud may have a silver lining after all! Ingalls says in his letter accompanying his contribution that he is glad we have heard from Clifford and asks if anything more has been heard about Birney Batcheller. The Secretary regrets to report that Batcheller died on November 27. We hope to have more particulars for publication in the next issue of *The Review*.

As to himself, Ingalls reports that during most of 1950 he was in impaired health which ended in hospitalization. Since September, he has been at home in comfortable convalescence, but is required to take things easy. He is still interested in historical study, especially in the iron works built in Lynn alongside the Saugus River in 1645. Under the aegis of the American Iron and Steel Institute, a grand recon-

struction is in mind. Excavations and surveys during 1950 have been illuminating, but there is still a good deal of this preliminary work remaining to be done.

At the Alumni Council meeting on November 27, we heard about the new Sloan Metal Processing building which will house the machine tool, foundry, welding and metal working laboratories. Professor Gerald B. Tallman discussed the Sloan Fellowship program for training in executive development. — ARTHUR T. CHASE, *Secretary*, Post Office Box 4, Island Creek, Mass.

## • 1887 •

We have heard from A. R. Nickels of Bath, Maine. He lived in Florida during the winter of 1949-1950 and spent some time in painting scenery of tropical subjects. Quite a surprise, as that was an unexpected talent. On account of sickness and hospitalization, he was unable to attend the last commencement in which he hoped to meet some classmates. But when we featured our 60th reunion in 1947, we made no further attempts for reunions — too few of us, and scattered too far. We had a report that the Class of 1888 sent but two of its members to their 60th reunion in 1948.

When Richard E. Schmidt, our Class President, was 80, five years ago, his entire office force cleared off their desks and gave a reception in the large office to all clients and friends. That amounted to being a "cocktail party." His 85th birthday was on November 14, 1950, and the directors of the Cosmopolitan National Bank, of which Dick is one of the directors himself, gave a dinner at the Lake Shore Club to which many of Dick's friends were invited. That bank is everything that its name implies as the management is composed of the descendants of men who came to Chicago from Europe three or four generations ago. The bank is a mile north of the Loop in Chicago, as way back in 1850 that district was settled by the ancestors of these bankers. — LONSDALE GREEN, *Secretary*, Bradford Hotel, Ft. Myers, Fla.

## • 1891 •

It was indeed a distinct shock to your Secretary to learn through a letter from Mrs. M. J. Lorimer (his daughter) of the death on November 8 of our esteemed classmate, Charles Clark, one of the "regulars" who was always at our gatherings, the picture of vigorous health and full of cheer and good fellowship. We missed him at our dinner last June, but did not know at that time that he had been seriously ill for some months.

The Boston *Herald* published the following obituary: "Charles Hiram Clark of 59 Brewster Street, Cambridge, authority on textiles, died . . . at Newton-Wellesley Hospital in his 84th year. For many years, Mr. Clark was editor of the *Textile Manufacturers Journal* and the *Textile World Journal*. He was the promoter of the United States Institute for Textile Research. He was a graduate of Wilbraham Academy. . . . He was a member of Thomas Lodge A.F.&A.M. of Palmer. He held office in both state and national

bodies of the Military Order of the Loyal Legion. He was a summer resident of East Gloucester. He leaves a daughter, Mrs. Monroe J. Lorimer, with whom he made his home, and a sister, Miss Geneva F. Clark of the same address. . . ."

Please note the change of address of Francis B. Choate to 1340 Edgehill Drive, Burlingame, Calif. In an interesting letter from Bert Kimball, 729 South Broadway, Redondo Beach, Calif., he wants to let us know that Walter Douglass is not the only '91 man that works out on the land. He also comments that he remembers Howard Forbes as "one of the bright minds of Course X." — FRANK W. HOWARD, *Secretary*, Bemis Associates, Inc., Post Office Box 147, Watertown 72, Mass.

## • 1892 •

The Secretary has just received notice of the death of William C. Meserve on November 2, 1950, at his home, 1728 Linwood Street, San Diego, Calif., after a long illness. He entered M.I.T. with us in 1888 from the Colorado Springs high school but withdrew at the end of his freshman year before becoming affiliated with any course.

Don Severance '38, Alumni Secretary, wants to know if we have started any organization to plan for our 60th anniversary. Your Class Secretary hopes to receive suggestions from members of the Class at or before the time of the Midwinter Alumni Meeting next February. Don't wait till then, however; after you have read this, pass along to the Secretary any suggestions as to what you think may be a proper way to take note of the occasion in June, 1952. — CHARLES E. FULLER, *Secretary*, Box 144, Wellesley 81, Mass.

## • 1893 •

Colonel Herbert W. Alden died at his home in Trenton, Mich., on November 10 at the age of 79. The following obituary appeared in the *New York Times*: ". . . Born in Lyndonville, Vt., Colonel Alden was descended from a family whose ancestry dates back to the Mayflower. After receiving his high school education in Peoria, Ill., he attended . . . Technology, from which he was graduated in 1893 with a Bachelor of Science degree in mechanical engineering.

"After his graduation he served for two years as an experimental engineer with the American Projectile Company in Lynn, Mass. For the next eleven years he was associated with the Pope Manufacturing Company in Hartford, Conn., and one of its allied companies, the Electric Vehicle Company, also in Hartford. It was about this time that Colonel Alden developed a four-cycle vertical engine, an important discovery for automobiles at the time, as well as the first magnetic transmission for trucks.

"From 1907 to 1909, he was associated with the Timken Roller Bearing Axle Company of Canton, Ohio, as chief engineer. He left that firm to become chief engineer and part-owner of the Timken-Detroit Axle Company. In 1914 he was named vice president of that firm, and in 1922 he was elected chairman of its board of directors, a position he held until 1940,



when he resigned to become director in charge of engineering — a post he held until his death.

"During the first World War, he enlisted as a major in the Ordnance Department, and later he was assigned, with the rank of colonel to work on the first American tanks. He served in France and Belgium and was in full charge of American tank designing work. He was said to have designed the first English-American tank, the 'Mark-VIII.' In 1919, Colonel Alden received the Distinguished Service Medal in recognition of his 'valuable services rendered while abroad.'"

Colonel Alden served for two terms as president of the Society of Automotive Engineers. He also was a member of the American Society of Mechanical Engineers, the Engineers Club of New York, the Automobile Club of America and the Detroit Athletic Club. Surviving are two sons, Horace Allen and Douglas Grier Alden, and a daughter, Mrs. William Hy-nard of New York. — FREDERIC H. KEYES, *Secretary*, Room 5-213, M.I.T., Cambridge 39, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, 38 Chauncey Street, Boston 11, Mass.

## • 1895 •

From all reports to date, it must be conceded that everything is under control. Your Secretary wishes all mates a happy New Year. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

## • 1896 •

It requires some time, of course, for class news to appear in print from the date of reception at The Review office. Therefore, be kindly disposed toward your secretaries if certain items seem to be late in reaching you. We have received a number of suggestions following our last notes and we quote these letters below. We planned a class luncheon at the Engineers Club in Boston and held an open discussion with all material at hand from your various suggestions as to our 55th reunion meeting place. You will receive a report of the proceedings with observations as to where we will assemble, date of arrival, transportation, and so on.

Helen Dodd writes as follows: "East Bay would not seem the same without Charlie Locke and others who have gone. I never expected to last for this reunion myself. Why not the Isles of Shoals? They do the Unitarian delegates very well and we who are now inland would love the sea again. Or even that would-be antique place at Nahant. Some of you who know the North Shore can suggest better than I, and I'll gladly go wherever you say, not too far from Boston. In a week I shall be going to my daughter's at 1 Elmhurst Road, Stoneham. So near Route 28 and the suburbs. I'd like to see any of you! Greetings to all."

From R. E. Bakenhus: "Perhaps it would be of interest at our next meeting if we had some sort of a statistical report. It seems to me I would prefer the 55th reunion in a Boston hotel. I do not have a car now so it would not be so easy to get to some out-of-the-way place. But — so far

as my real pleasure in a reunion is concerned, I would get more out of it by going to some country place. I live in a big city and do not have enough of the country life. Then, too, we would be more of a segregated and intimate group in some out-of-town place."

From Myron L. Fuller: "I returned to my home in Fort Myers on August 5 after an automobile trip to the Big Bend National Park of Texas and the Rocky Mountains of Colorado, followed by a two months stay at my bungalow on the pond in Easton, Mass. I have noted in The Review that there is some question as to holding another reunion at East Bay Lodge. While not particularly attached to that hotel, I much prefer some locality in the country to a city like Boston. In fact, it would be practically impossible for me to attend a reunion at the latter because of lameness and so on. I seldom stay more than a day at the outside, but have been to all reunions for 25 years or more. I should not wish my classmates to consider me in selecting a place for next June except as one favoring the old locality, or some other on the Cape."

From Will Coolidge: "I am attending the reunion regardless of where its held. It would certainly be easier for everyone to get to Boston than to East Bay Lodge. There is a real advantage in getting out of the big city, however, so as to avoid troublesome distractions. You may know of some suitable place which is easily accessible by train or bus from Boston. So far as duration is concerned, I think that we should have at least a full day and two evenings together. Two years ago Dorothy and I spent a very interesting month in Yucatan and Guatemala seeing something of the old Mayan civilization, and last winter we spent a month in Mexico visiting Toltec, Zapotec and Mixtec ruins. These are so interesting that we are tempted to go there again this winter."

From Butler Ames: "I want to thank you (John) for your kind note of November 14 concerning the holdup at my house in Tewksbury. At first I thought it was a belated Halloween trick by some of my nephews and expected at any moment to have someone say, 'Don't be worried Uncle Butler, it is all right.' But a pistol in my face, and four others standing around armed, soon convinced me that it was no make-believe. I hope we can bring the rascals to justice, for the good and safety of everybody. Everyone in the state, or country, should hear about it and should have in the back of their minds a fear and realization of what might happen to themselves when they were about to enter their own houses, through their own front doors, with their own keys — after having left it locked at 9:30 A.M., and returning at 1:15 P.M., only to find themselves held up by an armed and masked thug as the door opened; upon entering threatened with a pistol at their body; to find the entire house had been made into a shambles of disorder; and with everything of easy, portable, value evidently removed. After the cook had been compelled at gunpoint to cook the robbers a luncheon, and after handcuffing my chauffeur, we were compelled to enter a small room and were

locked therein from the outside and the key removed. The telephone wires had been previously cut and we were simply left there for someone to rescue us."

The Secretaries regretfully record the passing of the following classmates: Robert L. Fuller, 63 Brattle Street, Worcester, Mass., October 18, 1950; Norman F. Rutherford, Woollahra, N.S.W., Australia, September 28, 1950.

A most interesting clipping from the Boston Herald concerns one of our classmates and begins: "The head gardener of an estate named 'Forty Steps' in Nahant is a poet called 'Sire' by his butler. No doubt about it, there is something regal about Charles Hammond Gibson, a Proper Bostonian whose Victorian elegance at 75 puts modern manners to shame. And his verse, including a vast number of sonnets, elegies and odes, is considered by many critics to be as distinguished as the author." The article goes on to say: "The garden at Nahant has rivaled poetry as a major interest and occupation for half a century. . . . this horticultural wonder has attracted some 60,000 visitors from many parts of the world. It is famous for its roses. It was laid out, in a curious composition of the French and Italian formal styles with the Yankee casualness, largely by Gibson himself. . . . Gibson is quite as remarkable in himself as anything he has done. He is a small man, almost frail in appearance but with a nimble if sometimes cantankerous physique. . . . He cuts quite a figure at the head of a mahogany table laden with Bohemian glass. There is probably no more indefatigable conversationalist in New England than Charles Hammond Gibson." — JOHN A. ROCKWELL, *Secretary*, 24 Garden Street, Cambridge 38, Mass. FREDERICK W. DAMON, *Assistant Secretary*, 275 Broadway, Arlington 74, Mass.

## • 1897 •

Supplementing our advice in the December issue of The Review, we are in receipt of a note from William W. Pugh, M.I.T.'44, stating that his father, Harry Pugh, has made rapid improvement since his recent illness; is home from the hospital and is getting stronger every day. Every '97 man will rejoice at this good news, we know.

The sympathy of all class members will go out to Benjamin A. Howes in the loss of his wife who died in October. Ben is now staying with his son, Benjamin T. Howes, M.I.T.'39, who is production manager at the Pratt and Whitney Aircraft Corporation, East Hartford, Conn. Ben is not, at this time, in the best of health, and we would suggest that some of his old friends write to him. We know that their letters will be very welcome. His address is 199 Beacon Street, Hartford, Conn. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass.

## • 1899 •

Clancey M. Lewis, III, died on May 17, 1950. I am grateful to W. Scott Matheson, now the only '99 man living in the state of Washington, for the following facts: Clancey was born in Minneapolis

but prepared for M.I.T at Northwestern Military Academy, Highland Park, Ill. He was professor of mining engineering, applied mechanics and mathematics at Christian College, Canton, China, from 1899 to 1905. For a year thereafter, he was in charge of American Relief in South China. He returned to the United States in 1906 and settled in Seattle, Wash. In the years intervening since, he was secretary or editor of various building, engineering, good roads and municipal associations. He was a life member of the American Institute of Mining Engineering. In 1942, Clancey resigned as secretary of the Manufacturers Association of Seattle, Washington, and he and his wife formed the Lewis Development Company, a large real estate development company at Renton near Seattle.

W. Scott Matheson, II, and Clancey M. Lewis were cronies at M.I.T, both being interested in Y.M.C.A. work. After graduation, Scott went to Seattle, Wash., and since 1906 he and Clancey have been close friends and neighbors until Clancey's death. Scott was in the drop forging business from 1914 to 1930 when the plant was burned out. At one period he made all the drop forgings used by Boeing Aircraft. Later, Scott became field representative for the Isaacson Iron Works during the time the Coulee Dam was being built. Scott retired in September, 1949, but says he still finds plenty of interests that keep him busy.

Charles A. Smith, I, of 2426 Glenwood Avenue, East Lake, Atlanta, Ga., September 2 started on quite a swing around the circle. Stopping first in Washington, D.C., to visit Bernard Herman, I, he then went to New York City to hobnob with old associates in the American Transit Association. Chicago and Los Angeles were his next stops (he doesn't mention whether he met Gloria Swanson or Constance Bennett). Other California stops were Santa Barbara and San Diego. On the way back home, he visited his daughter in Dallas, Texas, later spending one night at a dude ranch at San Antonio. He arrived home on October 20. His is the first reservation I've received for our 60th reunion in 1959.

David E. Gray, VI, died on June 14 at his home in Corning, N.Y. David became connected with the Corning Glass Works on December 1, 1916, and was in active service there until his retirement on May 1, 1947. Since that date, he served the company as consulting engineer. David Gray collaborated in the development of various automatic machines, including devices for the manufacture of chemical ware and coffee makers. One of his outstanding accomplishments, recorded by his company was his work in the development of the famous "ribbon" machinery for the completely automatic method of making light bulbs. Quoting from the company's house organ: "Mr. Gray was equally distinguished for his work in Boy Scouts and held the Silver Beaver Award, the highest honor that can be paid by an area council. The award came while Mr. Gray was serving as the first commissioner of the Steuben Area Council which was chartered in 1921. Mr. Gray later served as president of Steuben Area Council and as

a Council director in addition to being a representative to the national council and an executive board member."

Carroll W. Brown, formerly of Cleveland, Ohio, is now located at 650 Sunset Avenue, Hagerstown, Md. — Word has been received through the Alumni Office of the death of W. Harry Mandeville of Tulsa, Okla. We hope to be able to furnish further details in a subsequent issue. — B. R. RICKARDS, *Secretary*, 381 State Street, Albany, N.Y. MILES S. RICHMOND, *Assistant Secretary*, 201 Devonshire Street, Boston, Mass.

## • 1900 •

Those who attended our reunion at The Pines last June will recall that Arthur White and his wife were not present on our last day there. We were somewhat worried about this at the time and the following letter from him brings welcome news: "Going from the very hot weather in Boston to the very cool weather at Cotuit, Mrs. White took cold and for a few days she fought it off. But Monday, on leaving Cotuit, she became worse and we had to consult a doctor who said that she had a virus pneumonia and that we had better slow up for a few days, which we did. We had intended touring New England after the reunion, but changed plans and went to Madison-on-the-Lake in Ohio where Mrs. White has a sister. There, after resting a few days, she became much better and we resumed our homeward journey through the Rocky Mountains on Route 40. This is a very scenic route and we enjoyed it immensely. We also stopped in Champaign, Ill., where we have a son studying for a master's degree in nuclear science. He is a graduate of West Point, 1947, and Uncle Sam is sending him to school some more. We both had a wonderful time at the reunion, seeing so many of the old friends and meeting new ones. We appreciate also the interest taken in us and it is always pleasant to be missed. Mrs. White joins me in sending our kindest regards to you and all inquiring friends." We were all very happy to see the Whites, who came so far to be with us, and are very glad that Mrs. White has recovered again.

The Secretary and his wife were doing their civic duty on election day when who should follow them into the polling place but John Beekman! John was looking the picture of health. We missed him at the reunion and missed having the opportunity of celebrating his birthday as we did at our 25th reunion.

Joe Draper left on December 11 for Florida for his usual winter at Palm Beach. His address there is 265 Coconut Row and we are sure that he would be glad to receive a call from any of the Class who may pass that way. He says that Louis Crowell and his daughters spent a week end with him this fall and that he also had a visit by Ed Davis. — Mrs. George Russell tells us that she is quite well again after a long siege of illness. — ELBERT G. ALLEN, *Secretary*, 11 Richfield Road, West Newton 65, Mass.

## • 1901 •

The first item of interest in this month's notes comes from material sent to Mrs. Pe-

tersen. As some of you know, Al Higgins retired as president of the Florida Power Corporation last spring. The following is taken from a paper published by the company. "President A. W. Higgins, a pioneer in the electric utility industry with 37 years' service including 13 years as president of the Florida Power Corporation, was honored on his 70th birthday with a retirement and birthday party on May 31 at the Florida Power Club by 125 top officials and old-time employees of the company. Mr. Higgins had made his 70th birthday the date of his retirement and his associates chose that occasion to honor him with a retirement party. Immediately following the dinner the directors of the company present were introduced and talks were made by vice presidents J. S. Gracy and J. F. Bailey and W. W. Wolff. . . . Gracy and Bailey related some of Mr. Higgins' biography and told of his outstanding contributions to the company, the industry, the communities we serve and the nation as a whole.

"Briefly, some of the tributes paid Higgins were: 'He is the kind of man who makes a deep impression on all those who come in contact with him, just as he has made a deep and inspiring impression on the entire company. He has worked untiringly for the advancement of the company. His guiding genius has driven it ever onward . . . to establish it in a position of foremost industrial leadership and to make it a model of good citizenship. Always a distinguished citizen, Mr. Higgins has encouraged the participation and leadership of company employees in civic affairs throughout the entire system, himself setting an outstanding example through his leadership in Boy Scout work, the Red Cross, Community Chest, Y.M.C.A., Chamber of Commerce and numerous other fine truly American service organizations in the communities we serve. His creative ability and business acumen are known and marveled at throughout this land of ours. A. W. Higgins is a man of many talents and not one to bury those talents. He has always put them to work overtime, developed them, watched them grow and expand and all for the benefit of his company, his fellow workers and his country.' W. W. Wolff read a very humorous and appropriate poem praising Mr. Higgins and reviewing some of the highlights of his career with Florida Power." I am quoting the last three verses. "Now Florida Power is rich and fat with millions in the banks/We're gathered here — Hig's comrades, to offer him our thanks/Hig went through Hell to do his job — and now he wants to rest/Let's raise our glass to the man we love and wish for him the best/So here's to Hig with all our hearts, the best man in these 'diggins'/Four-square, fearless, loyal friend — Albert Willis Higgins." "Mr. Higgins replied eloquently to the homage paid him, pointing out that although he was retiring he would continually be thinking of and frequently seeing his many friends throughout the company. He called the employees the finest group of men and women to be found in the whole electric utility industry and emphasized his pleasure at having worked with them so many years."



Charles M. Culp, who came to the Class after graduating from DePauw with the class of 1898, has been elected to the office of vice-president of the Seattle alumni group of his fraternity, Delta Upsilon. His professional work is that of a certified public accountant. I quote in part from a letter written by Harry Dart in Hartford: "I have been assistant secretary of the Hartford Steam Boiler Inspection and Insurance Company for several years. At present my principal work consists of the development of statistical data such as premium reserves, loss ratios and accident frequencies for the various classes of equipment which we insure. We use the Hollerith punch-card system with International Business Corporation machines and a force of 40 clerks. In our particular line of business our company is the oldest in America and the largest in the world. I used to do a good deal of work in rate-making on a committee of the National Bureau of Casualty Underwriters but have been relieved of such duties recently. I am in pretty good shape for the shape I am in, but I am subject to various restrictions as to diet, use of tobacco, and so on. I have a check-up every four months with a specialist besides a general physical check-up twice a year. I have to take it easy now and I don't get very far from home. For these reasons, I will be unable to attend the reunion which, of course, will be a very enjoyable affair. Please convey my emotions to any inquiring friends."

Sumner Hazlewood, Hancock Point, Maine, sends the following: "After I retired and began to fix up the old family cottage by the sea, I was quite a substantial citizen of 220 pounds; but after living in this invigorating climate and gaining every year, my doctor became dissatisfied with my portly appearance and threatened me with dire consequences, giving me such a scare that I unwittingly accepted the 'restricted diet' he prescribed and began to live an ascetic life. That was about the time of the promulgation of the 'Marshall Plan' and radio newscasters were telling us that the starving people in Europe required at least 1,500 calories to keep them alive. I was ordered to get along on 1,250 calories (it was no joke either) and began to wonder how long I was expected to survive. Well, the old doc got me down to a disrespectful 165 pounds. My good wife tried to make over my clothes but not very successfully. I finally dumped them into a large carton and delivered them to the Maine Seacoast Mission in Bar Harbor and got out my Sears Roebuck catalog to see what my limited bank account could provide. Now if you see a sylphlike old gentleman (probably unshaven) trotting along the Hancock Point avenues with a crooked cane, it's probably 'me' Sumner Hazlewood '01."

Archibald Klieves, retired, Wheeling, W.Va., doubts if he can attend the reunion next spring. Arthur Hayden reports: "Please note my change of address from 9 Florida Avenue, Bronxville, N.Y. to St. Michaels, Md. After 30 years sojourn in an American colony of a (more or less) foreign land, I am back again in the United States of America where I was born." Bob Williams writes as follows:

"Plans for our 50th reunion at Oyster Harbors are progressing nicely. At the time of writing these notes, the following say they hope to attend. Of course, there are a great many more to be heard from in answer to further questionnaires:

"G. W. Allen, H. V. Allen, W. C. Arsem, Charles Bittinger, John Boyle, H. W. Chambers, L. D. Chandler, C. N. Chubb, E. F. Church, F. W. Coburn, C. M. Culp, E. H. Davis, R. M. Derby, R. E. Dow, W. W. Dow, Lammot du Pont, Mansfield Estabrook, J. D. Evans, A. B. Gallup, P. F. Goodwin, G. A. Hall, A. W. Higgins, P. G. L. Hilken, W. G. Holford, V. F. Holmes, C. F. Johnson, W. G. Kelley, Grace MacLeod, G. E. Marsh, A. B. McDaniel, J. F. Monaghan, P. W. Moore, D. L. Ordway, N. K. B. Patch, Langdon Pearse, E. H. Pendleton, A. W. Peters, P. A. Potter, R. C. Robinson, B. E. Schlesinger, Edward Seaver, F. H. Sexton, R. E. Simonds, R. H. Stearns, T. H. Taft, C. G. Tufts, H. R. White, R. W. Wight, W. G. Wildes, R. L. Williams, H. I. Wood.

"In addition, there are 26 wives who also hope to attend. If you have not already received a second questionnaire, you will have one soon with more details. The Everett Moore Baker House on Memorial Drive and the Riverside Apartments recently acquired by the Institute for dormitories, will be available if you wish to have a room there the night of June 11. Reservations should be made as soon as possible with the dormitory managers." — THEODORE H. TAFT, Secretary, 21 Cypress Road, Wellesley Hills 82, Mass. WILLARD W. DOW, Assistant Secretary, 287 Oakland Street, Wellesley Hills 82, Mass.

## • 1902 •

Through the initiative and work of Dan Patch, a local reunion of '02 was held at the Graduate House on the evening of November 10. Some 50 notices were sent out, 22 replies were received, and 11 joined in a cafeteria dinner in the west dining room. During the dinner, Dan, as general chairman for the 50th reunion, told of the progress of the plans for the affair. As decided by canvass of the Class by the Secretary, it will be a stag affair and, also by choice of the Class, it will be held on the Cape. Bassett, as head of the committee appointed to secure hotel accommodations, has arranged that the reunion will be at the Coonamessett Ranch Inn in North Falmouth. The Class will occupy the Ranch House plus any necessary buildings, the rates to be \$12.20 per person, American plan. Bill is quite familiar with the place as it is but a few miles from his summer home at Falmouth. He states that the layout of the rooms in the Ranch House is ideal for a group that wishes to be together.

After Dan's report of several other plans still in the formative stage, Bassett took over and showed us a series of Kodachromes taken on his recent western trip covering the upper Rockies and the Californian coast. They were extremely beautiful and interesting. Those present to enjoy Bill's pictures included: Bourneuf, Collier, Ralph Franklin, Hunter, Moore, Patch, Philbrick, Adrian Sawyer, Grant Taylor, and Bob Williams.

Among those who sent their regrets was Charlie Shedd who writes: "Sorry I can't be with you but I have had arthritis since last spring and for seven weeks could not dress myself or help myself in many ways, but now I am better and can get around the neighborhood and out in the park and have had a few short rides but have not been in town for months. Am continuing to improve and hope to get further by spring. My chief hobby has recently been primitive and rational triangles and there is a manuscript of mine in the M.I.T. Library, I understand, and some articles in *Scripta Mathematica*. Do not plan to do any more engineering or other work. Four married daughters and seven grandchildren. Also a hobby — correspond all over the world, 206 letters since January from foreign countries."

Nickerson, one of the most elusive members of the Class has been located at Improved Risk Mutuals, 25 South Broadway, White Plains, N.Y. The Bert Shermans have taken up permanent residence at Sea Island, Ga. Bert writes that the climate is delightful and that their choice of a new home is a very happy one. — BURTON G. PHILBRICK, Secretary, 246 Stuart Street, Boston 16, Mass.

## • 1903 •

Our drive for the class 50-year gift is causing us to hear from several of the Class who have been out of touch for years. Howes has sent good suggestions in regard to district chairmen; Nolan shows interest in getting information about others in the Class; Hunter writes helpfully from the "Windy City"; and R. M. Field from Portland, Conn., R. C. Jordan from Columbus, Ga., Millard from Pittsburgh, have communicated with us. Glad to hear from you all.

We have heard that several members of the Class have died during the past summer and fall. George P. Carmichael, IV, died in Lawrence, Mass., on July 20; no further details — Frederick W. Garber, IV, died on August 7 in Cincinnati, Ohio. Garber was internationally known as an architect, designer of many of Cincinnati's largest buildings and schools. In later years, he was adviser to the Institute's architectural department, and was a member of the visiting committee of the art and archeological department of Princeton University. He is survived by his wife and three sons.

William M. Clark, VIII, died on August 20 at his summer home in South Portland, Maine. He was a glass-making expert with the General Electric Company in Cleveland, Ohio. After graduating from Yale in 1901, he came to the Institute to study electrochemistry. Later, he was in business in London for a short time and then joined the National Electric Lamp Company, now the General Electric, at Nela Park, Cleveland. Five years ago, he retired. He is survived by his wife, two sons, two daughters and nine grandchildren. For more than 40 years he was on the research staff, his field being, primarily, glass especially adapted to use in incandescent bulbs. He was recognized as among the foremost authorities in this field. — Robert C. Livermore died in Springfield, Mass., on September

20. He was superintendent of the Ware plant of McLaurin-Jones Company in Ware, Mass., from 1916 to 1946. He was at one time in the furniture and funeral directing business in Brookfield, Mass.

Of a more cheerful note, Myron Clark spoke at the October 16 meeting of the Worcester chapter of the Society for the Advancement of Management on the topic, "How to Audit Your Human Relations." Your secretaries are pounding away on our 50-year gift, and, so far, are encouraged by the responses from the few who have sent in their gifts. Another letter has probably reached you before now, and we hope you have taken advantage of the double credit outlined in it.

We wish for you all a year of satisfaction in work well done in 1950 and increasing chances of better success in 1951. Whether or not it will be a happy New Year will depend largely on ourselves, and the use we make of it, in a world far from happy. May we all hope and work for a world of peace and good will. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston 9, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, Box 103, South Wellfleet, Mass.

### • 1907 •

An article in the Brookline, Mass., *Citizen* of October 12, 1950, tells of our classmate, Leon L. Allen, having received the 33d degree in Masonry at the annual meeting of the Supreme Council, Ancient Accepted Scottish Rite, held in Philadelphia a short time previous to that date. Leon has held office in connection with the town of Brookline ever since 1907, having been town accountant since 1923. — A note from Allan Cullimore tells of his having met one of the political opponents of our classmate, Clarence Howe, of Canada, who told him that Clarence has made "an inestimable contribution to Canada." — John Frank wrote me telling of a little private reunion that was held in Chicago on August 27, the occasion being the 65th birthday of Sam Marx, Stud Leavell and Molly Scharff, M.I.T. '09, were present at the party. — Ed Lee, whose retirement from the New England Power Service Company was noted in The Review notes for the December issue, tells me that since his retirement he has been working as a hydroelectric consultant. — A clipping from the Chicago *Tribune* of September 11 describes at some length the success that has attended the International Trade Fairs held in Canada during the last three years and concludes with this statement: "Clarence D. Howe, Canadian Minister of Trade and Commerce, a shrewd Yankee trader who came to Canada from Massachusetts and . . . Technology, is the genius behind Canada's Trade Fair. He is a tireless worker and initiator of ideas to promote Canadian exports. In that Trade Fair he hit upon something that has gone far to make Canadian products known more widely in the American and the world market places."

Harry Moody has retired from active business and is now living at 25 Richard Road, Lexington, Mass., where he has built himself a small ranch type home. —

According to the Alumni Office, a new address for Stanley D. Moore is 4340 Baltic Street, Jacksonville 5, Fla. Stanley was associated with our Class in the Course in Civil Engineering. — Several honors have come to Ed Moreland during 1950. He was elected a trustee of Wellesley College in May; received the honorary degree, doctor of engineering, from the Johns Hopkins University in June; and in November was appointed by President Truman, subject to confirmation by the United States Senate, as a member of the newly created National Science Foundation, which consists of 17 educators and 7 other persons prominent in scientific fields, among the group being James Bryant Conant, president of Harvard University. — Harold D. Reed has retired from his work as an engineer with the New England Telephone and Telegraph Company, where he has been ever since 1907, and his present address is R.F.D. 2, Bristol, N.H. A new address for Tracy Smith is in care of Bradenton Trailer Park, Bradenton, Fla. Herbert Spear has written me that he is still with the Brown Company, paper manufacturers, in Berlin, N.H., and is now doing quality control engineering work. Phelps Sweett of Middlebury, Vt., has told me that last February he had a short visit with Christensen of our Class at Beaufort, S.C. Robert Tappan, who was associated with our Class in the Course in Architecture, is now at 232 East 50th Street, New York City. I have learned indirectly that Everett Turkington, who for many years was in charge of the electrical work for the Associated Factory Mutual Fire Insurance Companies with his office in Boston, has retired from active business. His home address is 6 Geneva Road, Melrose, Mass.

I have learned of the deaths of two members of our Class since preparing the notes for the December Review. Herbert L. Fletcher, who was associated with our Class in the Course in Electrical Engineering and who for practically his entire life was a sales engineer with A. B. S. Elevator Company and then with the Westinghouse Electric Elevator Company, died on November 10. — Through a note received on November 3 from Mrs. Mildred Nichols of 109 Prescott Street, Reading, Mass., I learned of the death of her husband, Prescott R. Nichols, on June 27, 1950. She writes that his passing was unexpected and very sudden. The larger part of Prescott's business life was spent with the Associated Factory Mutual Fire Insurance Companies of Boston as one of their examining engineers, although since 1935 until 1948, when he retired, he was connected with the Municipal Lighting Department of the town of Reading, Mass.

Twelve men of our Class met for an informal dinner at the Silver Room at Walker Memorial, Cambridge, on November 10, 1950. Those present were Dick Ashenden, Gene Banfield, Clinton Barker, Bill Coffin, Bob Crane, Seymour Egan, Albert Mansfield (this being the first class gathering that he has attended since 1907), Harry Moody, Bryant Nichols, Don Robbins, Oscar Starkweather, and Phil Walker. After enjoying one of the usual fine dinners provided by the Technology

dining service, we listened to a most interesting and informing talk by Dr. Edward P. Radford, Jr., '44 who is an instructor in physiology at Harvard Medical School and an expert assistant as a consultant on atomic defense of the Massachusetts Civil Defense Agency, being actively associated in this organization with Professor John W. M. Bunker, Dean of the M.I.T. Graduate School, and a coauthor with Dr. Bunker of the recently prepared primer on atomic defense which is being distributed in Massachusetts under the title, *Protection Against Atomic Bombs*. We secured Dr. Radford as our speaker through the helpful co-operation of Ed Moreland of our Class and of Dr. Bunker. He gave us timely and important information as to the various effects that would result if bombs were dropped and as to what should be done by the civilian population in taking care of their own safety as far as possible and in helping other people. — BRYANT NICHOLS, *Secretary*, 23 Leland Road, Whitinsville, Mass. PHILLIP B. WALKER, *Assistant Secretary*, 18 Summit Street, Whitinsville, Mass.

### • 1908 •

The first dinner and meeting of the 1950-1951 season was held on November 14, 1950, in the Grill Club Room, Thompson's Spa, Washington Street, Boston, at 6:00 P.M. The following were present: Joe Wattles, Sam Hatch, Cub Folsom, Leslie Ellis, Steve Lyon, George Freethy, Linc Mayo, George Belcher, Harold Gurney, Jeff Beede, Karl Kennison and Nick Carter.

Following an excellent dinner, and the swapping of news of happenings since our last meeting, Joe Wattles showed Kodachromes taken at Rotary International's meeting last summer at Detroit. He told us there were some 17,000 delegates there from all over the world. Following this meeting, he and Mrs. Wattles motored from Charlotte, N.C., through Tennessee and into Arkansas to visit Rotary friends. He showed us some fine Kodachromes of T. V. A. developments as well as of his friend's cotton plantation in Arkansas; also described his experiences while taking the "baths" at Hot Springs, Ark. Harold Gurney showed us some pictures taken on a trip to the Adirondacks. Those of Ausable Chasm, Ticonderoga and Lake Placid were especially good. Many thanks to Joe and Harold for a very enjoyable evening.

Harry F. Richardson became general manager of the National Council on Compensation Insurance last September. He has been secretary-treasurer of the Council for many years.

Jim McGowan, President of Campbell Soup Company, was present at the ceremonies on November 11, 1950, when ground was broken for the new \$2,000,000 food and biology laboratory at M.I.T. The laboratory was made possible by a grant of \$1,000,000 from the Campbell Soup Company in honor of the late Mr. Dorrance, M.I.T. 1895, former president of the company. — Henry Sewell retired on September 1, 1950, after many years with B. F. Sturtevant division, Westing-



house Electric Corporation, Hyde Park, Mass. Henry was honored with a testimonial dinner by his business associates at Patten's Restaurant in Boston.

We are sorry to report the death of Waldo F. Davis in Malden, Mass., on February 28, 1950; also the death of Clifford L. Wade in Toledo, Ohio, on June 23, 1950.

We report the following changes of address: Herbert C. Elton, 862 Merwins Lane, Fairfield, Conn.; Harold E. McPhee, 198 Central Street, West Acton, Mass.; Albert L. Messer, 26 Avon Street, Wakefield, Mass.; Warren D. Spengler, 4600 Lakeridge Road, Denver 14, Colo. — The second dinner meeting of the 1950-1951 season will be held on January 16, 1951, at 6:00 P.M. Usual reply post cards will be mailed well in advance of meeting. — H. L. CARTER, *Secretary*, 60 Battery March Street, Boston, Mass.

### • 1909 •

Last month we reported on the passing of Delos Haynes, VI. Since that time we have heard from Emma and the following is quoted from one of her letters: "You ask of Delos' interests. He was such a happy person — always carried small toys in his pockets to give to any child he chanced to meet. He was Santa Claus every Christmas Eve and called on our baby friends. He was calling on the second generation and said so often he hoped for the third. Because of our trips to Syria, Egypt, and Central America, he became deeply interested in archaeology and several years ago he took up photography with a Realist — a third dimension camera. His very beautiful slides are now being shown throughout the wards of the hospitals in the city and are a source of much interest. I, as a loving wife, could go on and on about him." Emma also sent the doctor's hood to Delos' academic gown, with colors corresponding to science at M.I.T., to the Review Secretary asking that he use it if he could and if not, to give it where it would be most useful. Inasmuch as we already have a suitable academic costume, contact has been made with the Institute and the hood will be given to some graduate who has recently acquired his doctor's degree.

Henry Spencer, II, recently sent us the September number of *The Lamp*, a Standard Oil publication. In it is described the oil refinery being erected at Fawley, England, on the shore near Southampton Water, by the Foster-Wheeler Corporation, the project which caused Carl Gram, X, to close out his farm in Pennsylvania and go with his family to England. The object of the refinery is to add 100,000,000 barrels of oil to the Middle Eastern imports on which Britain is becoming more and more dependent. Inasmuch as the Middle Eastern refineries cannot even meet the present oil-well production, such a refinery became a necessity. Considerable material comes from the United States and the difficult transportation by freight to New Orleans of a steel cylinder 96 feet long and 12 feet in diameter is described. This cylinder, which is the debutanizer tower, required two large floating derricks to place it in a

special cradle on the ship which was to take it to Europe. The new refinery will process 100,000 barrels of oil daily and will be the largest refinery in Europe for Anglo-American Oil Company, Limited. The deadline is January, 1952, and, no doubt thanks to Carl Foster-Wheeler has been able to describe this operation as "the smoothest running job for its size" they have ever tackled.

We learned that Garnett, III, and Jessie Joslin were up Boston way this fall and Garnett was kind enough to send us details of his trip. "Early in October I was called to New York for a directors' meeting. That over, Jessie and I went to Boston where Barbara and Ben Pepper met us with their car polished, greased and gassed, all set for a trip.

"Ben piloted us through the White Mountains to Quebec, Montreal and Ottawa and back through the Adirondacks, Lake Placid, Saranac, and Williamstown. In Montreal, I had a nice visit with Harry Rapelye '08 who is now president and general manager of the Continental Can Company of Canada. Rap is as big and handsome as ever. A little grayer, perhaps, but who am I to talk? We took it easy, driving not over 200 miles a day. On our return to Boston, Lobby had Jessie and me to dinner and then to see his new apartment. We were so enthralled with the view of the Charles and Boston we kept poor Lobby up half the night. Back to New York for another meeting and then to the train for Mexico. And so back to the old grind." — PAUL M. WISWALL, *Secretary*, Box 125, Glen Ridge, N.J. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: MAURICE R. SCHARFF, 366 Madison Avenue, New York 17, N.Y.; GEORGE E. WAL-LIS, 1606 Hinman Avenue, Evanston, Ill.

### • 1910 •

It has been most encouraging since the issue of the *MIT Ten Bulletin* to have received letters from many classmates. Cecil Blanchard writes as follows: "I read your interesting report of the 40th reunion, examined the pictures of the class members and enjoyed the whole thing although I do not know anyone in the Class as far as I can recall, and probably none can remember me. I was at M.I.T. only one year, doing special work in Course VII after graduating from Amherst. Was associated with men in '09 mostly, lived at home and so made almost no other acquaintances. Although technically in '10, I was not actually a part of the Class. Yet all these years I have been receiving your letters and notices, always read them and gradually grew to feel like a class member. So I just wanted to write these lines of appreciation to let you know I am more than a name in the addressograph drawer. So accept this letter as a friendly gesture of thanks for all the interesting letters and reports you have sent me, for the chance to see what you and the other men look like after 40 years and to wish you good health and continuing success for 20 years more."

Kenneth Armstrong sent me the following interesting letter: "The 40th reunion

class bulletin which arrived yesterday is very much appreciated, especially that part which contains the pictures of the old men I used to know many long years ago. Some of them I can still recognize. But what an awful lot of white hair, or no hair! One or two I have seen more recently, particularly Jack Babcock and V. T. H. Bien. But as for the rest of them — do I look that old? It was a very great disappointment to me that I was unable to attend the reunion, or at least the dinner at the Griswold on June 10. However, on that date I was in Casablanca, Morocco, on my way back from Liberia, and did not get to Westover Field until the following Monday night. During the past three years I have been traveling for the Air Force, and have been to such far away places as Newfoundland, Labrador, Baffin Island, Greenland and Iceland in the North Country; Tripoli and Saudi Arabia in the Near East, and Hawaii and Johnston Island in the Pacific, as well as such comparatively near places as Bermuda, California and Montana.

"This travel is, of course, by air, mostly in military planes, and since the transatlantic flights start from Westover, I occasionally have an opportunity to run down to Boston. That is how I expected to get to the reunion, and I had elaborately planned my trip to get to Westover in time, but unfortunately the flights were delayed. The plush job I had in the Department of Justice, about which I wrote four years ago, was abolished in 1947 leaving me hanging in the air with no place to alight, since I was the only engineer in the outfit, the rest being attorneys. After considerable looking around for a spot of equivalent grade, I was offered a job as pavement engineer with the old Air Transport Command, which became the Military Air Transport Service when the Air Force was divorced from the Army. The job is interesting mainly because it takes me to places I never expected to see. Not only the places mentioned above, but other places en route, where I sometimes have to stay a day or two at a time such as Frankfurt, Germany, Cairo and other places in North and West Africa. I have never been in Paris, but I flew over the center of it one clear day, only a mile and a half up; also other parts of Europe, Africa, Asia and North America, the Greenland icecap and the Sahara Desert. If I were a camera fan I would be able to give travelogue lectures, and maybe charge admission. However, I have not owned a camera for some 25 years, and it is too late to start now. I am eligible for voluntary retirement from the government service, but the opportunity to see the world at Uncle Sam's expense is too good to pass up, so I will probably continue until they kick me out, or I get too old and feeble to stand the gaff of constant traveling. I expect to start out again in a few days, this time to Hawaii and Johnston Island again. When in Honolulu I will certainly make it a point to see Walter Spalding. I saw quite a little of Honolulu when I was there a year ago, and feel that I know the town pretty well, as well as some of the rest of Oahu Island. You will note that I pick the right time to

go to these places — Hawaii and Bermuda in the winter, the North Country in the summer, the Azores, Tripoli and Arabia in the spring or fall. It takes doing, but I manage it somehow. I thought it was the wrong time when I had to go to Liberia last June, but found out when I got there that it was the cool season, the hot season being in January when it doesn't rain. I am still interested in home rule for the District of Columbia, and as active as I can be in civic affairs, but I am away from home so much that I can't do as much I would like. Best regards to yourself and all the classmates I didn't meet at the reunion."

Carroll Benton writes that the New York City '10 men are still holding luncheons every third Wednesday of each month. Be sure and call Carroll if you happen to be in New York on these dates.

The following is from the Foxboro, Mass., Reporter: "Malcolm B. Hall, recently appointed as director of civilian defense for this town, will proceed with organization work in the near future. He will attend several state meetings and will announce his plans shortly. Mr. Hall, who was credited with the success of the local civilian defense during World War II, was director. He received a commendation for his organizing the former civilian defense set up in this town. He has been active in the town government, and most recently resigned from the School Committee after having put into practice several changes in the school system. He is associated with The Foxboro Company, as supervisor of its training school, and is a member of the 25 Year Club of the company. A graduate of M.I.T., Mr. Hall is an engineer."

The following is from the *Wall Street Journal*: "American Meter Co. has elected John C. Diehl president to succeed Norton McKean, who resigned because of his health. Mr. Diehl has been associated with the firm since 1919, when he joined the American Meter staff as an engineer. He was advanced to the post of chief engineer in 1929, and in 1934 was elected vice president. The new president is a member of the American Gas Association and of the Gas Appliance Manufacturers Association, and is the author of numerous technical articles and books on gas measurement. Mr. Diehl was born in New Oxford, Pa. He received his education at Gettysburg College and . . . Technology. He resides in Erie, Pa."

Ridgway M. Gillis has been promoted to deputy state highway engineer of the California Department of Public Works. —HERBERT S. CLEVERDON, Secretary, 120 Tremont Street, Boston 8, Mass.

## • 1911 •

At this writing, class dues have been received from 102 '11 men, and reunion attendance indications are most encouraging, with 36 replies for 63 persons saying "excellent," 42 replies for 61 persons saying "fair" and 24 replies saying "poor" for chances of attendance. Our last three reunions, in 1936 and 1941 at Manomet, and in 1946 at Osterville, have averaged 107 total attendance: 56 classmates, 41 wives, 7 children and 3 guests. Reunion

Chairman Aleck Yereance, I, feels quite sure that we'll reach or surpass that average June 8 through 10 at Swan Inn, Harwichport, one of Cape Cod's outstanding hostleries.

Here are the 27 classmates who definitely plan to attend "double": Royal Barton, VI; Cap Besse, II; G. Arthur Brown, X; Phil Caldwell, I; Jim Campbell, I; Marshall Comstock, VI; Paul Cushman, VI; Fred Daniels, VI; Doc Davis, VI; Dennie Denison, VI; Jim Duffy, VI; Don Frazier, II; Stan Hartshorn, X; Milt Hayman, IV; Jack Herlihy, II; Hal Jenks, VI; Paul Kellogg, IX; Phil Kerr, II; Art Leary, XI; Bob Morse, VI; Hal Robinson, I; Warren Simonds, I; Don Stevens, II; O. W. Stewart, I; Harry Tisdale, V; Gordon Wilkes, II; and Aleck Yereance, I. Nine stags already on the bandwagon include: George Cumings, VI; Luis de Florez, II; Clarence Dow, I; Ken Faunce, VI; Harold Lord, II; Charlie Maguire, I; Dick Ranger, VIII; John Wilds, II; and Rufe Zimmerman, IX.

Seventeen indicate their chances of attending "double" as "fair": Syd Alling, VI; Liv Ferris, VI; Albert Herman, I; George Kenney, I; Charlie Linehan, I, party of three; Norm Lougee, VI; M. J. Lowenberg, VI; Roy MacPherson, II; Bob Mather, VI; Morris Omansky, V; Bill Orchard, XI; Armand Peycke, II; Carl Richmond, I; Don Southgate, IV; Willson Stamper, I, party of three; Ralph Vining, III; and Bill Whitney, V. Chances are also fair for 25: Harold Babbitt, XI; Ormond Bean, IV; Bill Coburn, I; Stu Copeland, II; George Cowee, III; Minot Dennett, II; Henry Dolliver, I; Norm Duffett, X; S. B. Dyer, II; William Dewey Foster, IV; Pete Gaillard, VI; Gordon Glazier, VII; Louis Golden, VI; Bob Haslam, X; Warren Hopkins, VI; Ed Kruckemeyer, IV; Otto Meisel, II; John Romer, V; Dan Smith, V; Frank Smith, III; C. B. Smythe, I; John Urquhart, XI; Howard Williams, XI; Vic Willis, I; and Bun Wilson, XIV.

These 24 classmates right now bemoan the fact that they are apt to be unable to attend: John Taylor Arms, IV; C. L. Bartlett, II; Ethan Collier, I; Lloyd Cooley, X; A. T. Cushing, I; Carl Ell, XI; Herb Fryer, VI; Marc Grossmann, III; Fred Harrington, I; Sam Hayes, V; Wes Jones, II; Hubert Judd, I; Mark Kinney, IV; Roger Loud, VI; C. A. Magoon, VII; Bart Nealey, I; Ed Pugsley, VI; Charlie Strong, IV; Guy True, I; Henry Van Hovenberg, XI; Ralph Walker, IV; L. B. Weeks, VI; H. H. Whithed, VI; and Bob Wood, VIII. Cheer up, boys, maybe things will break so that you can attend!

Featured by a splendid crayon sketch of our "Bob," the September issue of *The Lamp*, publication of Standard Oil Company (New Jersey), pays fine tribute to Robert T. Haslam, X, who has retired after nearly a quarter of a century of full-time association with Esso. In 1923, when Bob was head of the Chemical Engineering Course at M.I.T., he became a consultant to Humble Oil and Refining Company, a Jersey affiliate, and then in 1927 he resigned from the M.I.T. Faculty and joined Standard Oil Development Company. "As leader of a group of technicians who explored the application of this

chemical process to the oil industry," the article states, "he has to his credit many of the new and improved products which resulted — one of them being 100-octane gasoline, the fuel which became indispensable to the Allied air forces in World War II. . . . In 1933 he was asked to reorganize the lubrication sales department and two years later was permanently transferred from S.O.D., where he was then executive vice-president, to become general sales manager for Standard of New Jersey and in this position he demonstrated marked ability as an administrator. . . . In April, 1942, Mr. Haslam was asked to organize a public relations department for the parent company and on December 1, 1942, was elected a director, becoming a vice-president in 1945. Since the war's end, Mr. Haslam has been active in the rebuilding of Jersey's sales facilities abroad and in major reorganization of foreign sales operations." We are proud of your splendid accomplishments, Bob, and we certainly hope you'll have many years of happiness, at your home, 9 Shore Edge Lane, Short Hills, N.J., or wherever you may roam. But, please come to Swan Inn at Harwichport next June and renew old times! (P.S. We've just learned that Bob has become president and a director of United States Pipe Line Company, a new independent products pipe-line system.)

Addressing an Air Force Association dinner at Savannah, Ga., in early November, our General George Kenney, II, called for a revamping of the entire United States Air Force and said the Russians already are capable of hitting "any point in the country" by air. Just returned from a flying trip to Korea, where he picked up a germ and narrowly escaped pneumonia, George said the B-29's presently being used in Korea "are now six years old and would not last long against any real air opposition." He urged expanded construction of new type long-range bombers and said the Soviet Union will be tempted to take the United States "by the scruff of the neck" when it stockpiles more modern bombs and bomb carriers. George also urged support of a strong national defense act and said, "The amount of protection Americans get is strictly up to themselves." Try to make it at Harwichport in June, George!

On the same spot out on Huntington Avenue in Boston where Tris Speaker and other famous outfielders of Boston's American League baseball performed, the new Northeastern University \$1,500,000 library is now in process of construction and it will eventually house 150,000 volumes, in what President Carl Ell, XI, says will be "a working library for students who work." Right now, behind an "iron curtain" fence, nearly opposite the Boston Opera House, in addition to the foundations of the new library, workers are starting on a series of tunnels to make Northeastern unique among institutions of learning. Starting in 1952, the 11,000 students at Northeastern, and its faculty of 400, will be able to travel to and from any building in the university without going out of doors. Underground tunnels connecting the new Northeastern Library with all the other buildings in the univer-



sity group will be the result. A fine tribute to your leadership and ability, Carl!

In retrospect, Don Stevens, II, says the wonderful trip to the far Northwest and across the Arctic Circle, which he and Lois and their younger son, Carver, took between June 21 and August 21, was the most enjoyable trip ever. One of the high lights was an Arctic Circle "sightseeing" excursion they took in a chartered Bob Rice "air taxi," during which they were flown from Fairbanks to Beaver, over the Arctic Circle to Fort Yukon, down to Circle Hot Springs and back to Fairbanks. Later on, while at Skagway, they participated in a "Days of '98" party and on the final trip back east spent three wonderful days in Glacier National Park. — Bill Orchard, XI, of Maplewood, N.J., presided at the closing session of the first half of Upsala College's mid-century convocation at Newark on November 8. Out in Chicago, in late October, the M.I.T. Club there had a "fall tonic" tour as guests of the Monon Railroad, going to French Lick for a week end. Included in the party were Ed Woodward, VI, and his wife.

Nate Levy, I, a veteran of many years with the sewerage department of Boston's Metropolitan District Commission, was hospitalized for quite a spell in October and early November, but is now well on the road to recovery. In response to a cheering letter written to him, he wrote: "Have been quite a sick man and suffered a great deal of pain and depression from being in the hospital. Hope I may be able to join you at Harwichport as you suggest. Thanks for your very cheery and kind note." Also in Boston, we learn that in addition to the six workers mentioned in last month's notes, Cal Eldred, VI, and O. W. Stewart, I, are also workers in the Greater Boston phase of the M.I.T. Development Fund. Harold Babbitt, XI, professor of sanitary engineering at the University of Illinois for 10, these many years, writes that "unfortunately our reunion comes just at commencement time here, but I'll try to get away because I'm really interested." Ormond Bean, IV, writes that he is once again city commissioner at Portland, Oregon, and he hopes to time an eastern business trip so as to have the second week end in June with us on the Cape. From Salem, Oregon, Ethan Collier, I, maintenance and equipment engineer for the Oregon State Highway Department, writes: "It has cost \$11,000,000 each of the past two years for maintenance of state highways here, so I manage to keep busy. Killed a four-point buck last week (mid-October) and my wife and I are proud of our eight grandchildren."

In the November notes we wrote of Cushing and Cushing, consulting engineers, Kansas City, Mo., a new firm as of July 1. The senior Cushing, our own A. T., I, writes: "Business was going good until I became ill on September 30. Had an operation on October 9 and just got home October 17. Hope to be around in two weeks and start business rolling again." Paul Cushman, VI, writes from Oklahoma City that he and Otilie plan to be with us at Harwichport, but Frank Reid and his wife, friends of theirs who were with us in 1946, can't go this year for Frank's

school doesn't close until June 9. Paul adds that he and his wife are square dancing twice a week and love it. Although he has to be at Skytop, Pa., on June 11, Fred Daniels, VI, head of Riley Stoker Company, Worcester, and recently re-elected president of the trustees of Worcester Academy for his 11th term, plans to attend our Snow Inn party with his wife. And all the way from Riverside, Calif., hearken to these glad tidings from Colonel Henry C. Davis, VI: "Really, am going to try to make it — the first one I will have been to in all the 40 years. Will try for Pete Gaillard, Eric DeForest, Poke Cornell and Bun Wilson." And from Rochester, N.Y., Clarence Dow, I, writes: "I retired three years ago and am living the 'life of Riley'; golf almost every day and bowling in the winter unless I am foolish enough to go to Florida. Won the senior championship at golf here three of the last four years. Have a hobby, a woodworking shop in the basement and am as busy as a bee all the time. See you in '51, by gum!"

Norman Duffet, X, has retired after many years with the Electro Metallurgical Company at Niagara Falls, N.Y., and hopes now "to be able to do some of the things I haven't had time for, including reunion attendance." Jim Duffy, VI, Chicago business consultant and literator, writes: "As a class secretary you are wonderful! As an economist you are something less than that. Our class dues were set up in Wilson dollars. Today we use Truman dollars, so I am doubling my check to make up for the devaluation. It used to be that Washington's head was on our dollar bills. Today Washington's hands are on all our money!" From his retirement on Ashton Plantation, Lecompte Post Office, La., Liv Ferris, VI, writes: "The job of renovating my old home is even bigger than expected and will keep me busy at least another year. However, hope we can see you and Sara and the others next June." Bill Foster, IV, Washington, D.C., architect, thinks chances are fair that he can attend at least part of the reunion, for "I would like to see Johnny Bigelow and John Alter and any other Course IV men particularly." He adds: "I've been pretty well tied down for the last few years as we have been very busy and not able to get the help needed. Architects don't have the sun shining too often so they have to make extra hay when it does — so any real decision will have to depend on how busy I am at the office."

Milt Hayman, IV, writes from West Hartford, Conn., that he is back on a 48-hour week as building maintenance engineer at Pratt and Whitney Company, but he and Gertrude are hoping to be with us in June. Pop Hufsmith, VI, president of the First National Bank of Palestine, Texas, put it succinctly on a picture post card: "Sorry, Bub, can't make it this time — the d--n Democrats have been too rough on me." Wes Jones, II, writes from Chicago, where he continues as assistant to the general manager of Barco Manufacturing Company: "My eastern business trips usually come in May and December, so can't work them in for June. My vaca-

tion continues in Virginia as long as my 93-year-old Dad lives. My best regards to Jack Herlihy, in particular."

Here is the type of letter that puts real joy in a class secretary's heart — it's from C. A. Magoon, VII, for many years in government service, who writes from his home at 4308 Queensbury Road, Riverdale, Md.: "My check for class dues is enclosed. You probably do not know that I was a special student at M.I.T. for one year only, and while there made relatively few acquaintances. I went west from Boston where I remained for approximately five years and lost contact with those whom I came to know at the Institute, almost entirely. Consequently, there has been little incentive to meet with the class group. The records will show that for many years I have been a regular contributor to the Alumni Fund. I am now retired and on limited income and so shall have to leave it to the younger and more affluent men to carry on the Development Program." Wonderful! Equally frank was a letter from Harrison A. Smith, III, vice-president and manager of the Wisconsin Container Corporation, Menasha, Wis., a graduate of Princeton in 1909 who started the mining engineering course as postgraduate work with us the following fall. Not finding the course at M.I.T. just what he wanted, he stayed only two months, planning to go to Columbia the following year but going into business instead: "Under the circumstances, I am sure you can appreciate that I did not have much opportunity to really get into the 1911 family," he continues, "and I consider that my affiliation is with the Class of 1909 at Princeton. So I would suggest that you mark your records in accordance." This, of course, I have done, with a letter to Smith wishing him continued success and adding: "If at any time you feel there is any way that I or any other '11 man can be of assistance to you, please don't hesitate to call on me or through me on another class member."

Had a letter returned addressed to H. Rossiter Snyder, IV, Noank, Conn. Anyone know where he has gone? — Henry Van Hovenberg, XI, writes from Mt. Pleasant, Texas: "Right now it looks as if I'll be out of the United States most of 1951, otherwise am planning to be counted in on the reunion." Here's hoping, Van!

We had only a baker's dozen at this year's annual "Seven Come Eleven" class dinner at Walker Memorial, M.I.T., on the evening of the 7th day of the 11th month. It was election day and maybe we should have had it a night later. However, in addition to your Secretary, those present were John Bowman, XI; Marshall Comstock, VI; George Cumings, VI; Henry Dolliver, I; Jack Herlihy, II; Hal Jenks, VI; Roy MacPherson, II; Fat Merrill, I; Morris Omansky, V; Carl Richmond, I; O. W. Stewart, I, and Aleck Yereance, I. Following one of Bert Bridges' usual fine dinners, we had an interesting talkaround, during which Dolliver reported two new grandchildren since a year ago, making six in all, while Jenks reported a new granddaughter and "Dennie and Jack" each reported new grandsons. Merrill

said that graduations were preventing him from attending our reunion this year, a daughter due to graduate that week from Swarthmore, her husband from Haverford; and Fat's younger son from Dummer Academy. O. W. Stewart said his youngest boy and his wife flew to Liberia in August and are now "having the time of their lives" both teaching in a mission school there. Bowman called attention to the fact that the new Gloucester bridge on Route 128, on which he had been busy for many months, was to be opened on Armistice Day. Then, under Aleck Yereance's direction, there was a discussion of the forthcoming reunion and it was the consensus that, as at the past two reunions, it seemed better not to have any rigid program of events; but have things for folks to do if and when they want to, with the class banquet on Saturday evening, June 9, as the high light of the affair. As a major piece of advance publicity, Dennie agreed to put out another issue of *The Evident* in March, accompanying it with a geographically arranged roster of classmates. Ned Hall, VI, wrote from Washington: "Sorry to miss the 7-11 gathering but I've been down here since the first of the year with the Office, Chief of Engineers, in a civilian capacity. Age (60) has put us reserve officers on the shelf, so we have to be called in as civilians when they need us. I see Phil Kerr occasionally. Please use my Newburyport permanent address."

New mail addresses: Royal M. Barton, VI, 11 Powerville Road, Mountain Lakes, N.J.; Ernest J. Batty, II, 651 Canton Avenue, Milton 86, Mass.; Guy W. True, Box 2681, Raleigh, N.C. — That's it, folks. May 1951 hold more of what you desire than any year so far in your respective careers. And be sure it is high lighted by 40-year reunion attendance. — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

## • 1912 •

The *Railway Gazette* of London carried an article regarding H. R. Fox, who has recently retired as general manager of the Jamaica Government Railway. Fox served with the Royal Engineers in France from 1915 to 1918 with the rank of captain. From 1919 to 1921 he served as district engineer, P.W.D., British Guiana. From 1921 to 1926 he was with the Jamaica Railway as construction engineer becoming chief engineer. From that time until retirement, he was their general manager.

Bob Wiseman has been appointed vice-president and chief engineer of Okonite. He is also very active on technical committees in his industry. In fact, he is so busy that he has not had time to marry as yet. He rates as a fellow with the American Institute of Electrical Engineers, having served as chairman of the Committee on Power Transmission and Distribution. He is past president of the Insulated Power Cable Engineers Association having served on committees with both the National Research Council and the American Society for Testing Materials. He is a

member of the International Conference on large electric high-tension systems and United States representative on the International Electrochemical Commission's advisory committee.

Bernard Morash sends good news about himself from Toronto: "You will be interested to know that during August and September to the middle of October, I worked mornings; and since October 15, I have been working afternoons, as well. I guess you will not enjoy the happy privilege of sending flowers for my demise, as I seem to be fated to go on like George Bernard Shaw to reach the great old age of 94. Laura fell down the cellar and cracked her elbow and did some damage, but is doing all right. At the same time, I had an attack of appendicitis, but it has quieted down. My lad, Bill, is enjoying his work and stay in England. I think he will be returning next spring. I do not know whether he will stay with this English company, Pye, Limited, large manufacturers of television, radio, and so on. That is a rather cut-throat business with many ups and downs. He is getting a marvelous education right from the shop, research, cost and sales."

Dick Stickney writes: "Again this year (this time on Friday, the 13th of October) I traveled to Wentworth Institute, where my son is in his second and final year (aviation mechanical engineering) and saw the M.I.T. freshmen play football. It reminded me of the happy days when I traveled around with the M.I.T. sophomore football and basketball teams in 1909 and 1910. This was a tight game. Wentworth managed to get the only touchdown."

It is time we started thinking about our next reunion in 1952. Will anyone who has any ideas on the subject please send them in? Your secretaries appeal for more news from the Class. If you want to see the 1912 space in The Review well filled, you must do your part. How about a letter today? — FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston 8, Mass. LESTER M. WHITE, *Assistant Secretary*, 4520 Lewiston Road, Niagara Falls, N.Y.

## • 1913 •

Last June, I had a pleasant visit at M.I.T. with the Sages, Charlotte (Simonds) IV, and Nat. I. Rusty is director of the Division of Industrial Cooperation at M.I.T. I was impressed by the aura of his office, which gave me the impression that important persons come there for consultation. You can get an idea of Charlotte's work, taking care of Rusty and progeny, from her letter: "Here are the very belated dues for Nat and myself — we each thought the other had attended to it until spring housecleaning of my desk produced this. I hope to see you Alumni Day with a clear conscience. For news — after 11 years in a large rented house we bought a smaller one just a bit farther out and are settled cozily like two good grandparents, with a nursery included. All five children are married and the 8th grandchild expected shortly. Also, after 11 years we bought a new station wagon and our friends don't recognize us. And would you believe it, the old one is still

tooting around Technology in the hands of a student — a credit to an M.I.T. education."

One of the kicks that comes to a patient class secretary is a letter to break a silence of some 37 years. Perc Whitman, III, did that from 7012 Stanford Avenue, Los Angeles 1, Calif.: "Each year when I get your reminder I put it aside thinking I'll get time to write a few words and send the dues check along with it. Until now, I've finally sent the check but no word. So, here are a few at least. Things have been very good with me. Have a nice business, a son who just finished M.I.T. in '49, a fine son-in-law and three grandchildren. Enjoying life in God's country except when income tax payment days roll around. Then I think the country has gone to h---, but somehow seem to get over it. Was in Boston for my son's graduation and planned on having a fine time for myself. About the time everything was squared away, had to fly home so didn't see any of the old gang. What a poor bit of planning that turned out to be. Physically, am in good shape but bulge in the wrong places. Hope everything is fine with you. When out this way be sure and look me up."

Stanley Davis, VI, gives an alluring picture of Honolulu: "I have just returned from Honolulu where Mrs. Davis and I spent the month of February. While in Honolulu, I was very fortunate to run into Dr. Max Levine '12, who was gracious enough to show us around the Island. Dr. Levine is chief of the Bureau of Laboratories for Health on the island of Oahu. He lives in a beautiful home on top of a mountain overlooking the blue ocean. From his living room you get a panorama view of the mountains nestled with homes from the base of the mountain clear to the top. At night when it is lit up, it is the most spectacular picture I have ever seen. Honolulu is a beautiful city and seems to be especially designed for vacationists. The climate is very healthy and does not vary from day to day more than three or four degrees. It is generally around 78 degrees at high noon and drops to about 76 degrees in the evening. The natives are a happy lot. It is a mixture of about six races, and there isn't the slightest feeling of discrimination. Their homes, however humble, are surrounded with native growth, more or less jungle type. Gardenias and orchids grow in their gardens like dandelions in our backyards. The beauty and hotel service of the Royal Hawaiian Hotel surpasses anything I have seen on the mainland and, surprisingly, the prices are about one-third of something comparable around Florida. Don't forget Honolulu when you plan your next vacation."

Alex Morrison, X, writes from Lawrence, Mass.: "Nothing unusual to report. Still plugging along at the same old stand in the chemical department of the American Woolen Company where I have been since graduating in June, 1914. Have had the honor of being chief chemist since June, 1936. Looking forward to retirement in another five years; unless I locate a permanent position in the meantime." Rhys North, IV: "Am still architect for the public works division at the Norfolk Naval Shipyard, Portsmouth, Va. I



also teach sketch classes, and paint landscapes in oils, as a hobby. (Me and Winnie Churchill). My daughter has two boys and my son two boys and two girls; so, I am six times a grandpap. In three years I can retire if I wish and come back to God's country in New England."—Jack Horsch, XIV, resident chemist for Socony-Vacuum Oil Company, Paulsboro, N.J., writes: "Dues enclosed. Had to hold this until I could write that I had become a grandfather for the second time; a second son, Charles William, was born on March 12 to our daughter and her husband, Mr. and Mrs. J. W. Harrison, Jr. Our youngest daughter, and only other child, was married last June, her husband having two years of medical school still ahead of him."

Allen Brewer, III, a wheelhorse among contributors to class notes: "One dollar coming up. Thanks for the reminder. I'd have replied sooner but we were busy early in February with the wedding of my youngest boy, John. Now all three are married, and I'm glad to say doing excellently in their respective work. Allen, Jr., has his art studio in Lexington, Ky., and already is regarded as one of the top equine artists in the country. He also tops the old man in income. Gordon is sales engineer for Shell Oil in Erie, Pa., in competition with me (Texaco). John is still studying at the University of Kentucky. As for me; well, after 31 years with Texaco I'm becoming used to their ways. Lately, I've been active in the recently formed A.S.L.E. as program chairman, and so on. We still are clam diggers down on the Jersey shore. Four months in the year the commuting to New York City is annoying, but the other eight months, with the beach only two blocks off, make up for it."

Here's a record of a felicitous exchange of letters between two classmates. Gene Macdonald, I, wrote to Ken Franzheim: "Upon my return from a trip out of the country, I found on my desk on September 23 a telegram stating that two of the bridges that our firm had designed were given recognition by the American Institute of Steel Construction in their competition for good-looking bridges completed in 1949. It was not until just now that I ran upon the article in the *Engineering News Record* that named you as one of the members of the jury that showed such good judgment. Thank you for your compliment to a classmate which I am assuming was quite unconscious. If they have a dinner in connection with this business, as they usually do, I will hope to see you there." Ken's reply: "It certainly was a pleasant surprise to receive your letter of October 5 and to know that you are evidently prospering with your excellent connection in New York. Parsons, Brinckerhoff, Hall and Macdonald have had a wonderful reputation, but I never realized that the Macdonald was my old classmate. You won the awards in the competition on your merit alone. You had some excellent work and deserve the reward. Hoping that I will have the pleasure of seeing you in the near future and with kindest regards."

There's a new book that you should get: *The Rope Makers of Plymouth*, by a

Harvard history professor, published by Houghton Mifflin. It is a fascinating story of Yankee fortitude, integrity, ingenuity and shrewdness, unremitting over the past 125 years. Bill Brewster, II, incumbent, is the seventh treasurer and eighth president of this Plymouth Cordage Company.—FREDERICK D. MURDOCK, *Secretary*, Box 788, Pawtucket, R.I.

## • 1914 •

The first item to report this month is a sad one, the death of Walter G. Hauser on October 28. Walter was helping one of his sisters at their summer camp in Monroe, Conn., and fell while working only a dozen feet off the ground. He fractured his skull and died four hours later. Walter's home was in Bridgeport, where he had been engaged for the past eight years as an efficiency engineer. He is survived by his wife, the former Grace Edna Jordan, whom he married on March 23, 1929. Hauser prepared for the Institute at Crosby High School in Waterbury, Conn., and while there he was a classmate of Dinny Chatfield, to whom your Secretary is indebted for the first notice of Walter's accident. After leaving the Institute, Walter went with the American Pin Company at Waterville, Conn., and returned to this company after extensive service in France during World War I. He later operated his own business in the motor stoker field at Hartford. Since the end of World War II, he had been at Bridgeport.

Chatfield reports that he and Mrs. Chatfield spent their vacation touring through the Grand Teton region, Glacier Park, and the Canadian Rockies. No mention was made of Dinny's new hobby of horseback riding in the Rockies, but it is a safe bet that it came in for its share of the vacation period.

Jim Holmes writes that through most of this year he has been traveling far and wide and has not been restrained by the United States continental limits. He says that he was very busy before Korea, and much more so since the outbreak of that disturbance. It will be recalled that Jim's firm, Holmes and Narver, Inc., is located in Los Angeles and is one of the country's largest engineering companies. It has done very extensive construction work over a wide area for the United States Government.

Dana Mayo, Gardner Derry, Dean Fales, your Secretary, and wives held an informal Armistice Day dinner at Mayo's home in Newcastle, N.H. Here Mayo and his wife have taken the family homestead, which dates back to about 1700, and have reconditioned it and added to it to make it a beautiful and delightful spot on the Portsmouth Harbor waterfront. It really has to be seen to be appreciated.

Not to be outdone by Mayo, Dean Fales and his wife have transformed a home at Kennebunkport, Maine, into another delightful spot. It is not the house which makes Dean swell with pride, but the barn. This has been converted into a four-car garage—each with its own entrance—a fine work shop, and on the second floor, a library and office complete with couch and Oriental rug. This latter room has become the official headquarters

for the Kennebunk Beach Chowder and Marching Club, while the first floor is one of the way stations of the Veteran Motor Car Club. After seeing these establishments of Mayo and Fales, your Secretary has come to the conclusion that retirement from active business may not be such a bad "occupation" after all.—H. B. RICHMOND, *Secretary*, 275 Massachusetts Avenue, Cambridge 39, Mass., Ross H. DICKSON, *Assistant Secretary*, 126 Morristown Road, Elizabeth, N.J.

## • 1915 •

A happy, successful and above all, a healthy 1951 to all you classmates!

At The Boston Yacht Club (through Bill Brackett's owning a yacht) we had a class dinner and meeting on November 17. Twenty-one '15 members, including Max's guest, Louis Clemens from Framingham, and our own adopted Louie Gale, had our usual enjoyable dinner and evening. Wally Pike and Clive Lacy showed their colored pictures of the 1950 reunion and a reel of Speed Swift's colored movies of the 1946 reunion. It was a truly great show. The long distance winners at the dinner were Speed Swift, New London, N.H.; Ernie Loveland, Marion, Mass.; and Johnnie O'Brien, Woods Hole, Mass., where he is in the Coast Guard Engineers Corps.

The success of our Convocation luncheon in Boston in April, 1949, and the Copley Plaza cocktail party on Alumni Day, June 12, 1950, together with the growing acquaintances among the 1915 ladies, brought up the business of our having another party for the 1915 ladies. After an active discussion it was voted to have a cocktail hour and then dinner. As a reward for the splendid work he did with the class cocktail party in June, Wally Pike was appointed chairman of the committee and, undoubtedly, will again call on Barbara and Virginia Thomas and maybe others for help. Looks like the makings of another grand party.

Attending our class dinner were: Bill Brackett, Sam Eisenberg, Don Fowle, Fanny Freeman, Louie Gale, Abe Hamburg, Weare Howlett, Clive Lacy, Ernie Loveland, Azel Mack, Archie Morrison, Pete Munn, Frank Murphy, Wally Pike, Pirate Rooney, Jac Sindler, Ed Sullivan, Max Woythaler, Speed Swift, Johnnie O'Brien and Louis Clemens (Max's guest).

More honor for 1915 men. The Boston papers of October 17 carried long stories on the 16-page report prepared by our own Henry Sheils, covering his investigation of the charges of the Boston Finance Commission that waterproofing contracts on seventeen Boston school buildings during 1949 were not executed properly. The report was submitted to Mayor Hynes and represented a long and important study by Henry.

You will no doubt recall the work that Sam Eisenberg's son, Herbert, did last year on the Foreign Students' Summer Program at M.I.T. Sam recently wrote me about this splendid interest for Herb to have: "With reference to my little 'Hoiby' that we discussed the other day, and which you thought you might want

for the class notes, these are the facts: Because of his activities in connection with the Foreign Students' Project at M.I.T., Herby was elected to head foreign relations for the United States National Students' Association, at the National Students' Convention in Ann Arbor, Mich. His headquarters are at Madison, Wis., at the University of Wisconsin. He took a leave of absence from M.I.T. for one year and will go back and get his degree when he finishes his work for the N.S.A. He left for Europe the early part of December and will attend international students' conferences, representing the United States in London, Stockholm, Geneva, Paris and Rome. He will return sometime in March, and will probably make his headquarters to finish the work either in Washington or New York, to be handy to Foreign Embassies, the United Nations and the Unesco Conferences on education and student affairs. His work is closely tied in with the State Department and with various embassies and consulates in foreign countries, which work involves the screening of all applicants who wish to come to the United States as students from the four corners of the earth. It is a big job for our little boy and we are pardonably proud of him."

We invited young Jack Mohr '50 to our Boston dinner, as he had been with us, as my guest, during his undergraduate days. But Jack wrote that his new bride, and his new job (making glass at Corning) occupied much of his time and he could not get away. All the best to them both!

More fascinating foreign mail—from Herb Anderson at the Grand Hotel, Oslo, Norway: "I received the Hi-Jacs just before I left for the Midlands—England, and they do look attractive. Thank you all for the most excellent packing. Tomorrow I am driving down to Göteborg for a few days in Sweden and then next week I am flying from Stockholm to Amsterdam. Plan to be home for Thanksgiving. Just wanted you to know that I, too, had a grand time at Coonamesett."

From 79 Avenue des Champs-Élysées, Paris VIII, good Ken Boynton writes: "It has been a long time since I received your letter of March 30; but as you know, the summer is my busy time. This year I had occasion to visit both Greece and Turkey during the hottest time of the year, but in spite of the heat it was a most interesting experience. I had visits this year from Herb Anderson. We had a very pleasant chat about old times and about our classmates. I really appreciate it very much when any member of our Class takes the trouble to look me up while in Paris. According to your reports, you had a wonderful reunion this year, and I only wish that I could have been present. I remember the 1940 reunion, which was so completely enjoyable. Don't you think you should join the flux of tourists to Europe next summer and look me up in Paris?" In answer to Ken's last line; of course, if the Class should care to reward the faithfulness of their old Secretary with a trip, well—how about it? Help!

More honors: Al Sampson was recently made Boston division manager of the National Aniline division, Allied Chemical

and Dye Corporation. Al is the patriarch of dyestuff men in 1915, having been in the industry for many years. All the best to Al for success and happiness in his new position. Incidentally, other classmates as old-timers in the textile chemical business are: Ralph Hart, Hart Products Corporation, New York City; John N. Dalton, director of chemical department, Pacific Mills, Lawrence, Mass.; Alton A. Cook, technical director, Arkansas Company, Inc., Newark, N.J.; and Ed E. Proctor, Proctor Chemical Company, Inc., Salisbury, N.C. All doing well, too.

People with a serious technical interest in photography and what underlies photography should appreciate the up-to-date technical information in Allen R. Greenleaf's new book *Photographic Optics*, published by Macmillan.

Although Melville Coolbaugh modestly refrained from 1915 activities, he was always a generous supporter of the Class and contributed many interesting letters to our notes. His passing on September 9 is sad for our Class, and the following obituary is a tribute to his memory.

"Dr. M. F. Coolbaugh, 73, former president of the Colorado School of Mines, died . . . in Denver . . . after a heart attack. Dr. Coolbaugh was president of the school of mines from 1925 through 1946, when he became president emeritus. Following his retirement he did consulting metallurgical research. Born in Monroe County, Pennsylvania, Feb. 8, 1877, Dr. Coolbaugh graduated from Colorado College in 1902 and did graduate work at Columbia University, . . . Technology and Wesleyan University at Lincoln, Nebraska. He served as an instructor at Colorado College, the South Dakota School of Mines, the Case School for Applied Sciences at Cleveland, Ohio and the Colorado School of Mines, before taking over the presidency at Mines. Dr. Coolbaugh was a member of President Truman's 19-man committee appointed in 1947 to study problems of foreign aid. During the second World War he was regional representative for the government's engineering science and management war training program. Surviving are his wife, Osie of Golden, Colo., three sons and one daughter."

D. Porter Spencer died on June 12 in Racine, Wis. Unfortunately, we have no record of his activities or associations.

We need news for the notes. Remember our famous last line, "help Azel."—AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

## • 1916 •

Father Time has made his traditional exit with the passing of 1950 and we are again on the threshold of a new year. May we take this opportunity to wish you continued success and happiness in 1951. Along the same lines, it may not be too far off the mark to express our hope, at this time, that we will utilize every opportunity to bring happiness to those with whom we come in contact in the new year.

Your response to our appeal for news has been wonderful and included in the recent batch of replies was this nice letter

from Alfred S. Nibecker, Jr., of South Pasadena, Calif.: "As you may or may not know, I was only at Technology for a short time—was a special student in Architecture, not a regular student as such. For this reason, I hesitate to say much. Three of my children have graduated from college and my youngest daughter will when she finishes high school (four children in all, with six grandchildren, to date). I have been employed by the Los Angeles City Board of Education since 1926—coming here from my private practice as an architect. My title is business manager and architect. I have been honored by being made a fellow in the American Institute of Architects, an award that I am deeply thankful and grateful for. I keep my bills paid—play a poor poker game and fair golf. My one outlet for fibs and rest is trout fishing—which I do about two times a year. You now know all about me, and you can readily see why I didn't rush into the limelight. P.S. There is an M.I.T. graduate in your area that I am very proud of—he is my youngest brother, Rear Admiral Paul B. Nibecker '23, the commanding officer of the New York Naval Yard in Brooklyn." That story about playing a poor poker game wouldn't be a "come-on," would it, Al?

Some time ago we completed the circle by contacting all members of the Class asking for a paragraph or two for inclusion in our 1916 column. We quite often go back to some of the old reliables who have been generous in contributing before. Paul Duff is one of these, and on a recent request for more news from him he has come through nicely with the following: "A word from a classmate does start vibrations—echoes of the 'music we made together' which recalls Rusty leading us in songs and cheers—dear old Rusty—we went through Latin School together. Well, five of my 'children' are now in college. Ellen is at Emerson. One boy, Paul, our Marine veteran, is at B.C. Brian and Roddy are at Notre Dame, and John is at New York Medical College. Not long ago, I took several of the younger Duffs to Osterville (of happy memories) to hunt shells. We drones really appreciate what you 'organization men' are doing even if we are not as articulate as you would have us be."

Walt Binger is another of the old reliables to whom we turn now and then for a little more material for our column. His letter of October 10 says: "I have just returned from Turkey where I went to start the contract with the Turkish Government for studying their irrigation system and giving them advice. The contract is financed by the ECA. I sent over one resident engineer and he will be followed by others and I shall probably have to return to Turkey for a general inspection. It was very interesting to be in this foreign country on professional business. I wish the students at the Institute would realize how very important it is to know foreign languages. I happen to be able to speak French and German and I believe that made it possible for me to talk to at least four times as many Turks as if I had spoken only English, which greatly facilitated my work. The ministry gave me a



DC-3 with a Turkish crew of four to make inspections of river valleys. Besides being in the capital at Ankara, which was my headquarters, I also visited Istanbul (Constantinople) and Izmir (Smyrna). It is possible that we shall also be given the much bigger job of redesigning and supervising the reconstruction of the principal ports. The United States stands very high in Turkey, not only because we are lending them a good deal of money; but they really like us and what we stand for. I took the opportunity of giving myself a month's vacation traveling through Greece and Italy with my wife, one of my daughters and my son, Bronson, who is a junior at Harvard." A very interesting letter, Walt.

We had a letter recently from Hiram Beebe '10, Secretary of the M.I.T. Club of Southern California, enclosing two letters dated September 23 and September 24 from Meade Bolton in Cristobal, Canal Zone. This is much appreciated, H.B. On the latter day mentioned, Meade wrote that he was enjoying a cooling tropical breeze on the wide veranda of a hotel in Cristobal, where he was awaiting the arrival of his steamer. Meade indicated that after 34 years of government service, he was retired in April, 1949, as architect, the Panama Canal. As a result of a considerable amount of travel over the past year, he and his family have been fortunate in finding a place in Altadena, Calif., which they hope will be their future and permanent home. He mentions as he writes that Mrs. Bolton had been there several months unpacking the household goods that had been forwarded from the Canal Zone. He was about to sail to join Mrs. Bolton in Altadena by way of the Maersk Line steamer, the *Lexa Maersk*, up the West Coast to San Francisco, and was due there about October 2 or 3. He mentioned that he had spent July and August in Gorgas Hospital suffering from a painful attack of thrombosis in his legs and, although a little weak, he had recovered sufficiently to travel. Best of good luck, Meade. Glad to have you back in the States, and hope you can make the reunion again next year.

From a news item in the Boston *Herald* of October 26, we learned that we now have another general in our ranks in the person of Albert C. Lieber, Jr., who was promoted to brigadier general at Fort Belvoir, Md. Congratulations to you, Al, from all of us.

Dina Coleman brings us up to date on his activities with this letter: "After getting out of the Army in 1919, I batted around for two years and finally landed in the Bluegrass section of Kentucky, where I got into the coal mining and construction business with my late brother-in-law, David S. Gay. After his death in 1923, I took over the businesses but retained the company name out of sentiment, I suppose. Since then, we have expanded to brick plants, real estate and housing. I have tried, over the years, never to let business interfere too much with pleasure, with some degree of success. Lately however, it seems to be a losing battle, and at the very time in life when one should taper off. Regaining con-

trol of a greater amount of spare time will be my major occupation from now on. In 1936, as a sort of avocation, I took on Foster Gunnison's prefabricated homes, buying the second half dozen the plant put out. His system of house building has intrigued me so much that I have retained the dealership through the years. Now that prefabrication has been generally accepted, our sales are well over 100 houses per year, here. As to the family, I was married in 1924 to Dora Hoge, of Frankfort, Ky., and we have four children. A boy, Pope, was graduated from Harvard in 1948, and is now production manager for a chair company in Los Angeles. Bam! there went one chance of unloading some work. The second boy, Caruthers, Jr., quit the University of Virginia after two years and has gone into broadcasting. The playroom is a mass of radio and television equipment. Bam, Bam! there goes my second and last chance to unload said work. As to the twin daughters, Dora is finishing up at the University of Kentucky, after two years at Wellesley. The other, Louise, will finish at Sweetbriar next spring. As to hobbies, boating takes top place. We have supported a motor cruiser these past 14 years, and have cruised the coast from Palm Beach to Corpus Christie, Texas, as well as the Mississippi River, the Ohio and its tributaries. Besides being commodore of the Boonesboro (a Kentucky River Port) Yacht Club, I keep a membership in the Southern Yacht Club at New Orleans, it being our port of departure for either the East or West Gulf points. Exercise, other than elbow bending, is strictly taboo in my book, as it shortens peoples' lives. Designing, and negotiating for new quarters for our venerable Lexington Club, now 90 years old, with the past 75 years in the same second floor corner of the Phoenix Hotel, has taken quite a good deal of time and interest. The problem was to compress our floor space 50 per cent, and still get it at a price we could afford to pay, in the new, superdeluxe, air-conditioned hotel, which will replace the old one. The address will still be Phoenix Hotel, and I hope any '16 men who get down this way next spring will let me show them around."

Duke Wellington took a few minutes out to write us that "at the annual convention of the New England Water Works Association held at Poland Springs, Maine, September 17 to 21, I was awarded the Dexter Brackett Memorial Medal which is given yearly to the person having the most meritorious paper in the *Journal of the New England Water Works Association*. Samuel Jacobson '31 shared this award with me. The title of the paper was 'Introduction of Pre-Chlorination to Slow Sand Filters.' I haven't any more news to offer except that I hope to be in Florida for the month of February this year and hope to meet some of my classmates down there."

Joe Brodil dropped us a line from his haven in Riverside, Calif., telling us that although plagued with a touch of arthritis, and, as a result, limited in his activities, he still manages to enjoy himself putting around with his hobbies. He writes in part: "Strongly recommend the cultivation of hobbies as they are a blessing when

one's activities must be curtailed in later life." Although Joe writes that he has a suspicion that he is getting old and decrepit, he can probably still run circles around most of us.

Our thanks go once again to Mr. Beebe '10 for the following item: "The June *Westways* which goes to over 300,000 automobilists in the western part of the country described the State Building in Exposition Park in Los Angeles and went on to say, regarding an alumnus of 1916: 'Sumner Spaulding, who looks like an architect who studied in Europe and lived in Paris on the Left Bank is planning the three new buildings — a large hall, an auditorium, and a service building connected by a glass-covered patio, planted with floral exhibits. This is to be finished in 1951.' Alumni will have an increased interest in visiting the area around the Los Angeles County Museum at 38th and Figueroa."

In answer to our request for news, Steve Brophy sent us a nice letter from which we quote in part: "About all that has happened to me recently that might be of interest to anyone in the Class is my appointment as chairman of the Visiting Committee of Course XV at the Institute. Why a graduate of Course IV was elected for that job I don't know, but there it is. Oh yes, one other thing. The American Heritage Foundation, which I have been interested in for some years, is undertaking a major effort to persuade citizens to vote. I am enclosing copies of the material we have produced which you may find interesting." Not only did we find the enclosures to be interesting but from the recent election it would seem that your efforts did a great deal to bring out the voters in an off-year election.

On a penny post card, John Fairfield wrote us as follows: "I learned today of the death last week of Walter H. Fowle, II, in Woburn, Mass. He owned a band-saw factory there. He came within two months of graduating and then decided the degree not worth the extra time. I always liked Effie and am deeply moved at his departing. He leaves a wife and son who were in the band-saw business." Some of us knew Walter better than others, but all of us join in sorrow at his passing. Your Secretary has conveyed the sympathies of the Class to Walter's widow and son. John managed to squeeze a little more on his card when he wrote: "John D. Eberhardt still keeps home in Arlington, Mass., although he is away a great deal in consulting industrial engineering. He plans to give up active work before long and enjoy New England. Myself, I'm busy teaching mechanical engineering at Rensselaer Polytechnic Institute, Troy, N.Y." Thanks for the card, John. Maybe your example of how much news can be written on a penny post card will encourage others who haven't written for a long time to follow the same procedure.

Your Secretary would like to take this opportunity to quote a portion of a letter that he recently received from his son, Kennard, who graduated from St. Mark's School with honors and is now a freshman at Technology. The thought which he expresses below may arouse some recollec-

tions in your minds: "I find the work here at the Institute quite difficult, even more so than I expected. It's more than just a lot of hard work. It's a lot of hard work plus a lot more hard work plus a quick mind. It is the latter that I am having trouble developing." Sounds very familiar to your Secretary.

Once again, we take this opportunity to slip in the old faithful reminders: Take a few minutes out to drop us a line; your column can only be as good as your letters make it. Then, too, there is the reminder about the 35th reunion. The dates are June 8, 9, and 10, the location is somewhere in the Cape Cod area of Massachusetts, the program is "Enjoyment Unlimited." Make your plans now to be with us. — RALPH A. FLETCHER, *Secretary*, Post Office Box 71, West Chelmsford, Mass. HAROLD F. DODGE, *Assistant Secretary*, Bell Telephone Laboratories, 463 West Street, New York 14, N.Y.

## • 1917 •

The news has been received of the death of Harold E. Morse on October 22 at his home in Swampscott. He had been in the civil and electrical engineering field for 33 years, and during World War I, when he served as a radio operator with the United States Navy, while overseas was in charge of the land station at Lorient, France. Harold Morse took a very active part in community affairs in Swampscott, being a town member and a member of the Swampscott Water and Sewerage Board as well as past officer of several local business associations.

The increased fall activity of the Boston section of the Committee on Financing Development brought Stan Dunning out to lead the luncheon meeting in mid-November. Al Lunn sat at the head table, and your Secretary also caught sight of Rudy Beaver among the participants. President Strout has announced officially that Stan Dunning will head the 1952 Reunion Committee. Nineteen hundred and fifty-two will be a good year for reunion — there are several new additions to the campus well worth seeing. Word about Stan's general plans will be released in due course.

Peso Moody writes us from Malvern, Ark. (P.O. Box 158), that: "We are constructing a new 30-inch gas line from the Gulf Coast to Chicago and for the time being am located here in Arkansas. This town is about 50 miles southwest of Little Rock and about 25 miles south of Hot Springs. Very different country from the plains of Texas, Oklahoma and Kansas where I have been. I am hoping to get back to our 35th in 1952, but may get east sometime before then." — RAYMOND STEVENS, *Secretary*, 30 Memorial Drive, Cambridge 42, Mass. FREDERICK BERNARD, *Assistant Secretary*, 24 Federal Street, Boston 10, Mass.

## • 1918 •

The clipping services to which The Review subscribes, and from which class secretaries receive many an assist, have been flooded with newspaper items from across the land concerning the elevation

of Bill Foster to top Marshall Plan administrator. These have turned up enough items of interest to warrant an extension of last month's report. Speaking of Bill's golf (he shoots under 80) a friend said: "He swings hard but the main thing about Bill Foster is he has a h--- of a good follow-through." The fact remains that the friend put his fingers on the key to Foster's career as a public official. For whether Bill is engaged with a small white ball — or with the work of administering ECA, the biggest business enterprise in the history of international co-operation — he knows how to follow through. He isn't flashy; he isn't even particularly colorful. But he has that one great strength and it happens to be the strength which is needed in his job. In private life, as you will all jolly well remember, Bill was president of the Pressed and Welded Steel Products, Inc. It used to be a standing joke between him and former ECA administrator Paul Hoffman, whose deputy he had been for two years, that he sometimes made more money with his small plant than Hoffman made with the Studebaker Corporation, which is a big one.

"Bill Foster's personal history," says an ECA press handout, "has been solid and consistent." That about sums it up. His father, still very much alive, was and remains a mechanical engineer. Young Bill left M.I.T. to join the nascent Army Air Force, and in 1918 was commissioned a flying second lieutenant. The next year he went to work for Packard Motors in Flushing, N.Y., then moved over to the Public Service Corporation of New Jersey. He made his debut with Pressed and Welded in 1922 as a sales engineer. He became president of the company in 1946.

Life was pleasant and relaxed in the Scarsdale days. But that, of course, was before Washington. Life is different now for Bill. At 8:15 every morning, he is at his office. He rarely leaves before 7:30 or 8:00 P.M. His subordinates swear that, in addition to his regular duties, he reads every cable that comes into or goes out of ECA headquarters. Although he has been working for the government off and on for about eight years now, Foster is virtually unknown to the public, which may need a little time to adjust to the thought that he is now holding one of the world's most important jobs. ECA personnel will have no such difficulty. The fact is, for practical purposes, Foster has been the working head of ECA for months. His former boss, Hoffman, said recently that if he himself had any special talent, it seemed to be one for finding better men than he to carry on the jobs he had begun. Hoffman, of course, is a modest man. But there is no doubt that he feels, and rightly so, that he is leaving ECA in good hands. For Foster has a reputation as one of the best administrators around. He is a terrific worker himself, and he manages to make others want to keep pace with him. He has the knack, according to his subordinates, of instilling efficiency into an organization without producing an atmosphere of tenseness. He retains the easygoing personal approach of his Scarsdale days. Above all, he gets things done.

He has a rule at ECA that all the organi-

zation's bills must be paid within 24 hours of the time they are received. He said the government was getting a bad name because it was keeping its creditors waiting. Cables having to do with ECA's world-wide business receive similar speedy attention — or Foster must know the reason why. He is a stickler for promptness. When he was Averell Harriman's ECA deputy in Paris, he used to fine his subordinates 100 francs if they showed up late for staff meetings. He has discontinued that practice here in Washington, but his staff meetings still start on the dot of 8:30 A.M. And they end, also on the dot, at 9:15. The years in Washington have pretty well weaned Foster away from the Scarsdale atmosphere. He did procurement work for the Army during the war, ending up as director of purchases for the Army Service Forces. He won a medal for merit and the War Department commendation for exceptional civilian services. In 1945 he sneaked back briefly to his old haunts, but the next year Harriman hauled him to Washington again as Undersecretary of Commerce. He followed Harriman into ECA in 1948.

It looks now as though Foster is pretty well stuck there. He has always been a Republican, but the Democrats in those parts show no disposition to try getting along without him. He seems to have more of the kind of quiet, firm ability than can be spared by the government in times like these. His closest remaining tie with the old days, when a man could afford to take it easy, is *Forstar II*, a 62-foot cabin cruiser, the latest of a series of boats that have kept him occupied in his spare time ever since his seventh birthday. This past summer, he flew almost every Friday night to New York, boarding *Forstar* near LaGuardia field and sailing her around to Fire Island, Point O'Rocks, where he first met his wife years ago, and where they have spent every summer since.

In October, death took Garland Lufkin, following a long illness. He was then a vice-president of Owens-Illinois Glass Company which organization he had joined in 1921. He started as a draftsman in Alton, Ohio, and remained in that capacity for two years, later serving as furnace foreman, chief draftsman, and chief engineer. In 1929, Lufkin was named chief engineer for the entire company and transferred to Toledo. From 1931 to 1937, he served as plant manager at Bridgeton, N.J., and Newark, Ohio. In the latter position, he pioneered the development of fiber glass, which product is now manufactured by the Owens-Corning Fiberglass Corporation. Lufkin returned to Toledo in 1937 to assist in the development of the company's closure and plastics products business. He became general manager, which position he held until 1941, when he was promoted to general manager of the glass container division. Then in 1944 he assumed direction of the company's packaging and process research department. He was elected a vice-president in 1941 and received his 25-year service award pin in 1946. Prior to his association with the company, Lufkin was a mechanical engineer with the A. H. Kerr Company at Sand Springs, Okla.



As World War I began, Lufkin enlisted in the 101st Engineers and served with the American Expeditionary Forces overseas from 1917 to 1919. When he was discharged as a second lieutenant, he returned to M.I.T. where he received his degree in June, 1920. In 1926, Lufkin married Roma Helen Reilley of Alton, Ill., who survives him. — GRETCHEN A. PALMER, Secretary, The Thomas School, The Wilson Road, Rowayton, Conn.

## • 1919 •

Everett F. Doten writes: "No special news from Detroit. Activity in connection with Development Fund Drive. Did not get east for vacation this year but went up into Canada and back through Northern Michigan — very enjoyable trip." The following article appeared in the *Chronicle and Sun*, Cambridge, Mass., on October 19, 1950: "Dean Farrisee, of Clarkson Tech., and his wife and son, Dana, a student at Dartmouth, visited his mother at her home 50 Mass. Ave. recently. The Dean is a graduate of Rindge and M.I.T."

Jack Fleckenstein reports that his daughter, Joan, is still at M.I.T. taking geology and it looks now as though she might make the grade and finish. His younger daughter, Jacqueline, is a second year student at the University of Kentucky, taking mining engineering — of all courses, says he. He also writes that due to the crude oil shortage in Michigan, the refining business continues dormant. Was glad to report that he had a nice vacation — hunting — but not much game. Expects to go north after geese later and hopes to have better luck.

L. A. Gillett writes: "Still plugging along trying to help run a railroad. Only thing of interest that I can think of is the entrance of my son to M.I.T. this fall in the graduate school. He graduated from V.P.I. last June with honors in chemical engineering. Is taking Course XV at the Institute. Quite a kick out of seeing him walk in there with his books under his arm as I did so many years ago."

F. J. Given writes: "It is a long time since I have seen you, which suggests that we shouldn't let the 1950–1951 season pass without a 1919 gathering. Recently returned from a nice vacation trip to California where Esther and I visited with our son, Don, located in San Francisco. We became grandparents last June — a granddaughter, born in Morristown — Virginia Gregory. Have just recently resigned as chairman of Panel on Components for the Research and Development Board after service of two and one-half years. The last big event in connection with that was running a three-day symposium in Washington, May 9, 10 and 11, on 'Improved Quality-Electronic Components.'"

Roger T. Hall is still doing business in the nation's Capitol in the name of Spidel and Hall, Inc., trying to keep pace with the rapidly growing city — in the building construction field. Needless to say, under present conditions, he is kept busy — busy — busy; and while that situation is nothing to complain about, he is going to have to forego any annual winter pilgrimage to Florida's Gold Coast this year to stay home and attend to business. He enjoys

reading the class notes and is always glad to see any of the fellows who are down his way and have a little time on their hands for lunch or dinner, or something.

Recently had a card from Mrs. Celeste Brennan Hayden saying that her interest in M.I.T. is still very keen although her accomplishments are quite nontechnical; namely, five children (three boys and two girls) just a housewife. Mrs. Fred Pierson Olfene advises that she has moved from Lynn to Weston, Mass., and is continuing with work and postgraduate study — and homemaking. We have learned that L. B. Smith has been named manager of the Basic Laboratories section of Lever Brothers Company. Congratulations!

The following excerpt is taken from an article that appeared in the October 6, 1950, issue of the *Elgin, Ill., Courier-News*: "If you are full of vim, vigor and vitality, out to make your mark in the world, and are looking for a job, there's a 34-page pocket-size booklet which should prove most helpful, indeed. It's called 'Office Workers Manual' and it was written by Alexis R. Wiren, director of methods and planning, group department, The Equitable Life Assurance Society of the U.S. The booklet is published and copyrighted by the Bureau of Business Practice, Inc., 100 Garfield Ave., New London, Conn., where copies may be obtained at nominal cost. The Manual is packed full of timely pointers helpful to any person who wants to do a good job . . . who wants to forge ahead . . . who wants to make the most of opportunities and capabilities. It's 'must' reading for most everyone who works for a living." — EUGENE R. SMOLEY, Secretary, The Lummus Company, 385 Madison Avenue, New York 17, N.Y. ALAN G. RICHARDS, Assistant Secretary, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

## • 1920 •

Your Secretary held a very concentrated class reunion at the Farmington Country Club with Buck Clark earlier this fall and was able to declare himself the winner in a golf tournament but must confess that it was simply because Buck was even higher up in the hundreds.

Bob Patterson, Perc Bugbee, Al Wason and Ken Akers have been active as group leaders in the local M.I.T. Development Fund campaign; and energetic hard working captains include Carl Leander, Joe Hennessy and George Manning.

David P. Brown, chief surveyor of the American Bureau of Shipping, recently published a paper on structural design and details of tankers in the magazine *Shipbuilding and Shipping Record*. General Lyman P. Whitten has been appointed northeast commander with headquarters at the Pepperell Air Force Base, St. Johns, Newfoundland. J. Harold Stacey has been active in Vermont state politics. He lives in Windsor, Vt.

Enoch Doble has moved from Sharon, Conn., to Wellfleet, Mass. Mal Lees is now in Ridgewood, N.J., address 250 Gardner Street. Ernie Bangratz is now living at 476 Washington Street, Wellesley. Ned Cochran has been appointed head of the Maritime Administration with headquarters at

4842 Commerce Building, Washington. Howard Field is in San Diego, Calif., address 811 Yarmouth Court. Cliff Goodrich is living in Dalton, Mass., address 49 Orchard Road.

News has been received of the death of James B. Leary who was located at Virginia Beach. His death was reported as of May 9, 1950, but we have no details.

As these notes were about to be mailed, a welcome letter came in from Chuck Reed who is provisional director of Forbes Finishes division, Pittsburgh Plate Glass Company in Cleveland. Chuck expresses keen regret at having missed the reunion. We can tell him that he was sorely missed. His older son, Edwin, who graduated from M.I.T., Class of '45, is associated with him in business and, like Chuck, he married a Wellesley girl. His younger son, David, is a sophomore at Yale. — HAROLD BUGBEE, Secretary, 7 Dartmouth Street, Winchester, Mass.

## • 1921 •

When five more months of this 30th reunion year of 1951 have rolled around, a large 1921 group will be heading for the Sheldon House, Pine Orchard, Conn., to enjoy the program set up by Irv Jakobson's reunion committee for June 8, 9, and 10, to be followed by a trip to Cambridge on June 11 for the Alumni Day events. Some members of the Class have not yet returned the questionnaire which formed part of the mailed announcement of the reunion. The committee earnestly requests that the completed form be sent in at once. A decision at this time is not binding but will greatly assist the committee in determining how many to expect. Notify your Secretary and another copy of the questionnaire will be forwarded by return mail.

Replies to the mailing are most encouraging. About 75 of the first 125 to answer said they will probably attend the reunion and the committee is looking forward to a large representative group. In addition to some 40 members of the Class listed here last month, the following have also indicated attendance: Wally Adams, Allen Addicks, Al Bachmann, Jack Barriger, Tom Bartram, Larry Castonguay, Ed Chilcott, Dewey Clarkson, Doc Cook, Josh Crosby, Ed Delany, Al Garrigus, Harry Goodman, Manny Green, Paul Hanson, Dan Harvey, Munnies Hawes, Sumner Hayward, Roy Hersum, Mel Jenney, Harry Johnson, Chick Kurth, Bill Loesch, Willis MacComb, Charlie Mackinnon, Joe Morrell, Vic Phaneuf, Herb Reinhard, Helier Rodriguez, Fred Rowell, Ray St. Laurent, George Schnitzler, Ed Steffian, Horace Tuttle, Sandoval Vallarta, Bill Wald. Harry Field of Honolulu says he isn't sure yet whether he can make it again this year. For the moment, this leaves the distance award to Ed Chilcott of Pasadena, Calif. Antonio Rodriguez of Cuba will continue his unbroken record and be with us for the sixth consecutive year. Val Vallarta will journey from Mexico City for the occasion.

Edmund G. Farrand, Chicago member of our secretarial committee and devotee of equine riding, racing, jumping and polo,

has retired as secretary and general manager of the United Conveyor Corporation. In advising that he will attend the reunion, Ed says, in part: "My aim is to get out while I am ahead physically and find something that will let me lead an outdoor life. I have been surveying the possibilities of a beef cattle farm in the southeast but am open to other solutions." Ed reports that Jack Barriger, genial President of the Monon, recently took the Chicago Alumni on their second annual trip to French Lick, Ind., via his Chicago, Indianapolis and Louisville Railway. He continues: "It was truly an unimaginably enjoyable event. Our Class had the largest number present, including Daniel P., and Mrs. Barnard, 4th, John W., and Mrs. Barriger, Ralph D., and Mrs. Cooper, Edmund G., and Mrs. Farrand, Richard H., and Mrs. Morris." Young David Farrand, the famous fisherman of our 20th reunion, is now attending New Mexico Military Institute.

Arnold C. Rood has removed his office for the practice of patent and trademark law to 53 State Street, Boston 9, Mass., where he is a member of the firm of Wright, Brown, Quinby and May. George F. B. Owens of the Brooklyn Union Gas Company has a new home in Babylon, N.Y. Lawrence B. Richardson, former rear admiral, is chief engineer of the Fairchild Engine and Airplane Corporation of Hagerstown, Md. John J. Winn, Jr., has returned to the mainland from Honolulu and is living in Petersburg, Va. New addresses have been received for Walter A. McKim, Mrs. Z. Carleton Staples (Amy Baker), and Mrs. Gretchen E. Taylor (Gretchen Eichorn). Richard P. Windisch is a partner in the investment firm of W. E. Burnet and Company, 11 Wall Street, New York 5, N.Y., and a director of several companies. He and Mrs. Windisch have three sons and make their home in Scarsdale, N.Y. Whitney H. Wetherell is a sales engineer for the Carrier Corporation in New York City and has a special assignment as an instructor in the general education division of New York University. Daughter Lois is a senior at Simmons College and son William is in high school.

Arthur G. Wakeman, Executive Vice-president of the Coosa River Newsprint Company and General Manager of the new \$32,000,000 Coosa River newsprint plant in Alabama, was the principal speaker at the second annual meeting of the Louisiana Forestry Association. A recent note from Art advises that he will attend the reunion and that his daughter, Frances, is at Smith College. Irving D. Jakobson, President of the Jakobson Shipyard, Inc., Oyster Bay, N.Y., has delivered four more of a fleet of high-power Diesel-electric tugboats to the Lehigh Valley Railroad, according to the New York *Herald Tribune*. Several clippings tell of various activities of Saul Silverstein, President and General Manager of Rogers Corporation, Manchester, Conn. Tendered a surprise dinner on his 20th anniversary with the company, he also spoke at a Hartford meeting of the Society for the Advancement of Management on his company's adaptation of the Rucker plan for sharing production and evaluating productivity.

Ralph M. Shaw, Jr., continues on his way to Italy from where we paused in his long letter last month: "At the border we picked up the Italian railroad. Most all Italian railroads are electric and the one along the Riviera is three-phase with two overhead wires and two pantographs on the locomotives. Genoa is pretty well shot up. The Bristol Hotel is in one piece and that is where we stayed. We went to Rome by train, pulled by an electric locomotive that rolled along at 80 with no effort, noise or dirt. The poles holding the catenary are four-inch pipe. The top carries the feeder wires and a two-inch pipe extends on each side. Pin type insulators hold the catenary to this crossarm. The uprights are between the tracks and one pole is used for either two or four tracks. About every five miles there is an anchor tower. The locomotives develop 2,000 horsepower at the drawbar. They cruise at 85 with a top speed of about 120 miles per hour. All the power is generated by hydro stations in the Alps and transmitted the length of Italy on 110-kilovolt three-phase lines. Shades of whoever said it takes steam plants to balance hydro stations, I saw only one steam plant, a little one in Rome. Phase shifters located every 50 miles along the line provide for low voltage feeders on each side, eliminating the single-phase high voltage lines used here. Rome is lovely. It is clean and everyone seems to be going somewhere on important business. The streets are full of miniature Fiat and Renault automobiles with an occasional American car. Bicycles are everywhere. Those in the money have a motorcycle and the also-rans have a bicycle with a motor. An interesting sight was a tandem bicycle with papa at the head end, mama on the rear seat, a small engine driving it and behind a two-wheel trailer with parasol and windshield, in which were strapped two children. Three suitcases were roped on the trailer. These people were touring Italy." (Continued next month.)

Wallace T. Adams, specification engineer for Armco Drainage and Metal Products, Inc., Middletown, Ohio, says he has a grandson almost three years old and a new granddaughter aged six months, both children of his daughter, Joyce. Son Richard was graduated from the University of Cincinnati and David attends Michigan. Wally is state secretary of the American Society of Civil Engineers and active in the Boy Scouts of America. Norman F. Patton writes from his home on Overbrook Road, Rural Delivery 2, Dallas, Pa., that he is chief statistician for the Anthracite Institute, Wilkes-Barre, Pa., the industry trade association. Norm says he is looking forward to seeing the gang at the reunion and adds: "I am busy since moving here almost four years ago. I travel the eastern part of the country and Canada representing the industry in all sorts of capacities, the latest being on the radio for the Pennsylvania Week celebration. I also testify before the Interstate Commerce Commission on freight rate cases, Federal Power Commission on natural gas extension, Senate and House committees on oil imports, St. Lawrence Waterway project, natural resource reserves and so on. I can go from

office to home in 17 minutes, over two mountains and with hardly any traffic. We're in the middle of beautiful farm and grazing country. I've gone civic, too, with community efforts in a half-dozen different directions. I have also joined the Shrine and have a good deal to do with its activities."

John A. Facey has his own business in Springfield, Mass., as a manufacturer's representative on heating and ventilating equipment. Grandson John A. Facey, III, son of John, Jr., is now almost nine months old. Jack's second son, Edward, is a member of the Class of 1952 at Technology and the youngest, Jerold, is in school at home. Robert E. Waterman is vice-president in charge of scientific and technical affairs of the Schering Corporation, pharmaceutical manufacturers of Bloomfield, N.J. A director of the company and its subsidiaries, he is also a member of the American Society of Biological Chemists, the American Association for the Advancement of Science, the American Chemical Society and formerly the chairman of its North Jersey section. He is a member of the board of education of Harding Township, near Morristown, N.J., where he and Mrs. Waterman make their home with their two young daughters, Mary, aged ten, and Janice, who is six.

Edward R. Chilcott of Pasadena, Calif., is the owner of Technical Products Company of Los Angeles, contract manufacturers in metal products, Albert E. Bachmann is vice-president in charge of manufacturing and a director of Missisquoi Corporation, Sheldon Springs, Vt., paper manufacturers. Al is president of the Technical Association of the Pulp and Paper Industry and a member of the American Management Association, the National Association of Cost Accountants and the Superintendents Association. Recently he has written for the TAPPI magazine. Son Ted is at Peddie. Walter E. Church, senior member of the firm of Church, Newberry and Roehr, Portland, Oregon, architects, writes that early this month Pietro Belluschi, a friend and colleague of the four 1921 architects in Portland, will become dean of the School of Architecture and Planning at the Institute. Walt says his youngest son, McGregor, was married last September to Linda Brown of Portland and they make their home in San Mateo while he is finishing a pre-medical course at Stanford. The eldest son, Dudley, M.I.T.'47, has two sons, three-and-a-half and six months old. Son William is studying architecture at Technology in the Class of 1952. Walt is president and director of the Oregon chapter, American Institute of Architects, a director of the Portland chapter of the Society of American Military Engineers and a member of the Military Order of World Wars. In community affairs, he is a member of the Riverdale Zoning Commission and a former chairman and member of the Riverdale school board. Following his recent trip abroad, he has delivered an illustrated talk on architecture in Scandinavia to the Oregon Ceramic Studio and the Oregon chapter of the A.I.A.

Dr. Sampson Brown, for the past twenty-one years a practicing physician



in Medford, Mass., died at his home on October 7, 1950, as he was preparing to visit patients, according to the *Malden News*. Born in Lawrence, Mass., on June 15, 1898, Sam prepared for the Institute at Lawrence High School. At Technology, he was a member of the Chemical and Menorah Societies and received his degree in Course X. Following a year of special study at Boston University, he entered Tufts Medical School and was graduated in 1928. He interned in Cambridge and then moved to Medford to start his practice. He was a member of the American, Massachusetts and Medford medical societies. Surviving are his wife, Mrs. Katherine Brown; two sons, Richard and Robert of Medford; a brother, Daniel, of Lebanon, N.H.; and three sisters, Mrs. Dorothy Kaplan of Hanover, N.H., Mrs. Lillian Fostie of Brighton, Mass., and Mrs. Marion Katz of Manchester, N.H., to whom we extend sincere sympathy on behalf of the Class.

Why not contact someone that you would like to see at the reunion and tell him to mark his questionnaire "Yes" and send it in now? — CAROLE A. CLARKE, *Secretary*, International Standard Trading Corporation, 67 Broad Street, New York 4, N.Y.

## • 1922 •

Dave Harris is now vice-president of the Shenango Pottery Company, china manufacturers located in New Castle, Pa. Dave says in a letter to your *Secretary*: "We are quite comfortably deposited in the extreme western portion of Pennsylvania in a town which was once a tin and steel center, was reduced during the depression to a 'ghost town' as reported in the *Saturday Evening Post*, and is now the center of a large pottery industry and one or two heavy machinery building companies." Dave's company makes the Haviland and Castleton lines of home china and a major portion of all high-grade hotel tableware. Bob Brown, executive engineer of Parks-Cramer Company, Fitchburg, went abroad on his company's behalf in the latter part of November for a period of several weeks.

No doubt the novel readers in the Class have already finished Eric Hodgins' new book *Blandings' Way*. This will probably strike a sympathetic chord with many of us.

Lewis P. Tabor has been recently appointed associate director for electronics and instruments at the Franklin Institute in Philadelphia. He directs the work connected with miscellaneous electronic problems involving electronic computation and simulator work; also, simulation and graphical computation methods for the study of air traffic control problems, studying the various factors and assisting in evaluating proposed systems of controlling air traffic to prevent accidents. In addition, he is commanding officer of the Naval Reserve Volunteer Ordnance Unit 4-3, Philadelphia.

Bob Tonon, who has spent his summers in Duxbury for many years, took to the water for two weeks in August and cruised the Penobscot Bay area with your secretary, Mich Bawden '21 and Ed Ryer

'20. Bob was officially designated cook and though he was not quite that when we started, the force of events compelled him to be one by the time we got back. Brod Haskell took in the Andover-Exeter football game on November 11. His silver thatch is very becoming and he truly looks the part of the New York banker. Charles Chittick, your Secretary's son, having received his B.S. degree from M.I.T. last summer, is now in the Service again at the Naval Air Training Station, Pensacola.

Unofficially, we are advised that Frank Kurtz has moved up from the presidency of the American Coffee Corporation to the parent A and P to be in charge of their manufacturing subsidiaries. This information may be garbled slightly but it will convey the general idea of a substantial step up. Frank's two boys are both away at school, one at Hackley School in Tarrytown and the other at Princeton.

Bill Mueser, whom your Secretary saw in October at Mt. Kisco, looks in the pink. His two boys are also away at school, one being at Technology and the other at Duke. — News has been so scarce recently that if more does not turn up shortly, I will have to put in an appeal like Azel Mack's monthly cry in the '15 notes.

NEW ADDRESSES: David H. Harris, 313 Summer Avenue, New Castle, Pa.; Clinton B. F. Brill, 200 East 66th Street, New York City; Francis M. Kurtz, The Great Atlantic and Pacific Tea Corporation, 420 Lexington Avenue, New York City. — C. YARDLEY CHITTICK, *Secretary*, 77 Franklin Street, Boston 10, Mass. WHITWORTH FERGUSON, *Assistant Secretary*, 333 Ellicott Street, Buffalo 3, N.Y.

## • 1923 •

President Killian's annual report noted the promotion of W. P. Allis to full professor and the appointment of Horatio C. Sexton as an associate professor in the Department of Naval Architecture. Captain Sexton was formerly commanding officer of the Charleston Naval Shipyard in South Carolina.

Raymond P. Harold, President of the Worcester Federal Savings and Loan Association, was in the press a number of times in November, including a full-page personal story in the Worcester Sunday *Telegram's* Feature Parade section. Another news item recorded his being cited by the Worcester Veterans' Council for his work as chairman of the Worcester Housing Authority. Another item reported that he was among officers of the National Savings and Loan League who made a call on President Truman at the White House.

James S. McDonnell, Jr., of McDonnell Aircraft Corporation, St. Louis, was featured in the aviation section of *Time* magazine of October 23, in which the growth of his corporation to the seventh biggest in the aircraft industry was recorded. His company apparently got an order to build the first carrier-based jet fighter for the United States Navy in 1945 and has concentrated its research on jets. The Navy ordered 235 twin-jet Banshees as a starter and, the *Time* story reports, has since greatly stepped up its orders. Other planes the company is making have the interesting names "Voodoo," "Parasite Jet

Fighter" and "Little Henry Ram-Jet Helicopter."

William S. LaLonde, Jr., Head of the department of civil engineering at the Newark College of Engineering, is currently president of the Metropolitan New York section of the American Society of Civil Engineers.

Georg Vedeler is professor of naval architecture at the Norwegian Institute of Technology in Trondheim. An item under Norwegian shipping news in the periodical *Fairplay*, published in London, reports that Professor Vedeler has been made managing director of the Norwegian Veritas which, apparently, has to do with the problems of the Norwegian Merchant Marine. — HORATIO BOND, *Secretary*, National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. HOWARD F. RUSSELL, *Assistant Secretary*, Improved Risk Mutuals, South Broadway, White Plains, N.Y.

## • 1924 •

Well, Walt Kennett made it. That is, he managed to stay put up at Bowdoin long enough to get a new ROTC Transportation Corps unit going, at least. As head of the course, he rates a full professorship. And, incidentally, the press release refers to him as "Colonel" Kennett. That's a new one, too. — George E. Lamb, major, U.S.A., retired, died in Washington, D.C., on September 27. An electrical and mechanical engineer, he had been employed by the government on many projects. Major Lamb, who got his master's degree with our Class, was 75. Also deceased, Lyle A. Clough, in October. Clough was with us for two years getting his master's. He had served in both World Wars.

From the Springfield *Republican* comes a pre-election note on one of our Democratic classmates: "Ralph Alden chairman of the Democratic city committee, declared that the idea he might be a candidate for mayor was a figment of someone's imagination. We hope that if he is ever elected to office and holds true to the things which MIT taught him, he will not fall into the common error of Democratic politicians that the supply of money is infinite like manna from heaven and that public debt is only a figment of the imagination, too." Department of anti-climax: We have no idea whether Alden ever ran for the office.

Two months ago the 1926 notes made mention of a '24 man. One of their number visited the big hydroelectric development outside of São Paulo and noted that "The engineer in charge of construction is Adolpho Santos, Jr., '24." Also noted, Dolph has a couple of other M.I.T. men working with him: Not noted, that this job is the brainchild of the father of a '26 man who started out in 1924, A. W. K. Billings, Jr. Are you completely confused? Mrs. Ruth H. Westbrook, one of our coed architects (Ruth Hampson) has come back east again after some time spent in California. She is now settled in Black Mountain, N.C. And Dan Officer, who left Washington after the war to come back to Boston (actually Hingham) has answered the call again. He's back in Washington.

Some of you will remember the ill-fated attempt of Bill Rowe and his cohorts on *VooDoo* to publish a "La Vie Parisienne" number during our senior year. It got as far as the cover which somehow fell into the hands of the advisory council. A stern warning killed the whole idea right there. Now, after 26 years, it has appeared! A recent issue, reprinting some of the more lurid items of the '20s, used the scantily-clad bathing beauty for its cover. Somehow, in these days of Bikinis, it doesn't seem very startling. While we're on the subject of Humor As We Knew It, here's one from *The Tech*, our freshman year. At the Tech Show smoker it was reported that "Fatima was on hand to welcome all comers and Lolly Pop was a close second. Messrs. Dough Nutt and Ginger Ale topped off the evening's entertainment." Bet that one laid us in the aisles. Incidentally, some of you former Tech Show men may not have read that Virginia Tanner died a few months ago.

A very great tragedy occurred in Otto Koppen's family in November. His oldest daughter, Justine, 20, while up for an instructional flight at Canton Airport near Boston, was killed in an attempted night landing in a pea-soup fog. Ironically, Otto's work has made him one of the country's leading experts on safe flying. His plane, the Helioplane, was not involved.

The new listing of Alumni Council members for the year includes the names of six '24 men as follows: Holland H. Houston, National Nominating Committee; Lynn P. Marsh, Class Representative; and representing Alumni Clubs, George W. Knight, Detroit; Herbert R. Stewart, Shanghai; Avery A. Ashdown, Tampa; and Henry B. Kane, Los Angeles. As usual the club representatives are anxious to be sent to visit their constituencies. Maybe Barnacle Hank could accommodate Herb. Then we have a number of Honorary Secretaries spread around the world. They're the boys who screen prospective students, you know. Among them are Douglas F. Elliott; James F. Crist; Prescott H. Littlefield, our vice-president; Richard T. Lasister; Holland H. Houston; Clarence M. Cornish and Thomas M. Nevin. Not many of us are holding down local club offices this year, but Tony Rosado is president of the Havana Club; Sam Graham is secretary in Honolulu; Phil Bates still presides in Los Angeles; Jack Nevin in Mexico City; and Emerson Van Patten is the Milwaukee secretary. So the Class is fairly well represented in alumni affairs.

In late November, Harold Hazen traveled to Syracuse to tell the members of the M.I.T. Club there all about the Institute's new humanities program. Harold is a member of the committee charged with putting it into effect. Just in passing, Course VI, which Harold heads, is still the largest in the Institute. It now has an academic staff of 260 members, as many as there were on the entire Institute staff when we entered as freshmen. And his departmental budget is as great as the Institute's academic budget in 1942! Its enrollment of more than 900 makes it as big as many colleges. That's quite an operation.

Another year comes to a close. As we look ahead to 1951, may we dare hope that it will be a year of greater understanding, of wiser guidance, and of clearer vision? Somehow it seems as though the roller-coaster ride must end sometime. Could this be the year? — HENRY B. KANE, *General Secretary*, Room 1-272, M.I.T., Cambridge 39, Mass.

## • 1925 •

One of the top news items covered the appointment of Marion W. Boyer, X, to the post of general manager of the United States Atomic Energy Commission. Mr. Boyer took over his new job on November first. In taking the new position, he resigns from the senior executive group of the Esso Standard Oil Company, where he has been vice-president in charge of manufacturing. His resignation from that position ended 23 years of service with the company. His work included various progressively more responsible assignments in research, manufacturing, and executive capacities. A considerable part of this service was spent in direct charge of one of the largest and most complex refineries in the world, located at Baton Rouge, La. Many major developments in the oil industry have been pioneered at this plant. It was one of the top producers of aviation gasoline and synthetic rubber during World War II. Chairman Gordon E. Dean of the Atomic Energy Commission commented as follows: "The Commission is gratified that Mr. Boyer has accepted the top management post in its staff. He brings to this key place in the atomic energy program broad executive and technical experience and a record of outstanding success as the director of large-scale manufacturing and research operations. His record as a working scientist and an executive in development insures effective teamwork with research men as well as production operators in the atomic energy program. At this time of urgent need for speed, efficiency, and growth in atomic energy output and development, we are fortunate to command his talents."

It is my sad duty to report information sent to us by Hiram E. Beebe'10, Secretary of the M.I.T. Club of Southern California, of the death on July 9, 1950, of Lauriston E. Clark, X, better known to his classmates as Pete. Pete had been located in Los Angeles since 1928 serving as head of the research department in Technicolor and in 1943 becoming director of engineering. He held this position up to the time of his death. Mr. and Mrs. Clark had just returned from a trip to England and the end was quite unexpected. I am sure every member of the Class joins me in expressing our sympathy to Mrs. Clark.

It was recently announced that John H. Fielding, X, had been elected chairman of the rubber division of the American Chemical Society at its recent semi-annual meeting in Cleveland, Ohio. John, at present, has charge of research and compounding development in the plants of the Armstrong Rubber Company in West Haven, Conn., Natchez, Miss., and Des Moines, Iowa. He had been connected with the Goodyear Tire and Rubber Company up to about two years ago when he

assumed his post at Armstrong and moved from Akron, Ohio, to Milford, Conn., where he now resides.

A news clipping from the Newburyport, Mass., *News* states that E. Willard Gardiner, IX-B, industrial engineer for Sears Roebuck and Company, was the speaker at a recent meeting of the Merrimac Valley chapter of the National Association of Cost Accountants. This clipping went on to state that Willard is a well-known industrial consultant and was formerly a lieutenant colonel attached to the Control Division Headquarters where he developed the work simplification and work measurement programs of the Army Service Forces. He is a past president of the Society for Advancement of Management.

Your Secretary recently visited Washington on business and looked up Ralph Ilsley, XII, and spent a very enjoyable evening with him and his wife, Sally. Ralph is still holding forth in his position with the Armed Services Explosives Safety Board, dealing with numerous problems which keep him quite busy. One of the purposes of my trip to Washington was to attend meetings of the Engineering Colleges Research Council. At one of the panel sessions, discussing the topic, "Utilization of Research Facilities and Personnel," Thomas J. Killian, VI-A, scientific director of the Office of Naval Research, was one of the group of high powered panel members. Tom carried off his part of the program extremely well. — F. LEROY FOSTER, *General Secretary*, Room 5-105, M.I.T., Cambridge 39, Mass.

## • 1926 •

The clipping services brought in only one news item this month — about Ward Hamilton. The Rochester, N.Y., *Times-Union* gave a write-up about Ward's experiences as commander of transportation around Seoul, Korea, in the military government after World War II ended. His intimate knowledge of the area emphasized the remarkable feat of our Marines in landing at Inchon.

One of the first classmates to respond to my personal notes for information for the notes this month was Frank Cramton and without further comment I'll pass on his most excellent letter to you: "It was nice to receive your note asking about news of 1926 men in this vicinity. It came at a very opportune time as I have been working on the Development Fund drive and can pass along considerable information that you would not have received at any other time. Also, I am sure that the Class had the record for attendance at the Philadelphia Club dinner held at the Campbell Soup Company on October 24. No doubt the tenderloin steak dinner, with all the trimmings, put on for a grand total of \$2 apiece by James McGowan'08, President of the Campbell Soup Company, contributed in part for the large turnout. But Professor Schell and Lobby were a real attraction, especially for us Course XV fellows. Seen at the dinner were Dick and Mrs. Jones, Bob and Mrs. Richardson, Ken Lord, Ralph Smith, Bernie Morgan, Allan MacQuarrie, and George Bates. For those interested in how and what the other fellow is doing — Dick Jones is living



in a beautiful spot on a hill in Wyncote. The address is Bent Road. He has two youngsters, a boy and a girl and is the head of the personnel department for the Atlantic Refining Company. Bob Richardson is living out on the swanky Main Line in Swarthmore where he says his family just loves it and he is still associated with the Ethyl Gasoline Corporation. Ken Lord also lives out on the Main Line and is the hard working district manager for the Reliance Electric and Manufacturing Company of Cleveland. He has two girls, the older of which is a senior at Smith College where the younger one hopes to matriculate in a year or two. Ken is a staunch supporter of the M.I.T. Philadelphia group.

"Ralph Smith, after having charge of production at the Aluminum Company of America plant in Bridgeport, Conn., has been sent to Philadelphia to take charge of aluminum casting sales in the area. He has been living within two miles of the writer for three or four years and neither of us knew it until this last month. He has two children, the older of which a boy, is a freshman at Abington Junior High School, Abington, Pa., where the family lives on Huntingdon Road. Bernie Morgan is administrative engineer for the American Viscose Company in the Gimbel Building, Philadelphia, and lives in the city with Mrs. Morgan. At the various dinner meetings, I also ran into George W. Bates who is with the Philadelphia Electric Company here in Philadelphia. I did not get a chance to get further information. (Secretary's note: How about writing us more G. W. — thought you were still in Medford.) Allan MacQuarrie is in the sales department of the Electric Storage Battery Company and is quite busy traveling around the country selling Exide Batteries. He is living at 640 Crescent Avenue, Glenside, Pa., in a pretty brick house with a charming wife and two boys. Lee Cummings is still working for the Atlantic Refining Company here in Philadelphia as process engineer and seems to be enjoying his work very much. He and Mrs. Cummings live in Wyncote just a short distance from Dick Jones and also a short distance from myself. He has two boys.

"With the reservation that I may have missed other '26 men who have been coming out to the club meetings I will pass along to one or two I have met in my travels. I ran into Dave Shepard in New York a short while back at the Export Advertising Association Convention. His boss was scheduled to be one of the main speakers and Dave, with a number of other Esso executives, were there to give him moral support. Dave evidently likes his work in this country and the opportunity of sending his youngsters to college here. He tells me that his daughter is now at Vassar and doing splendidly. He is looking forward to the 25th reunion along with the rest of us. Out in Chicago I happened to run into Frank Wilkinson who is an assistant to the sales manager for the Enterprise Paint Company and doing a grand job of selling paint to all the paint stores in the mid-west. At the rate he was going, I expect he is now president of the company. He has three youngsters, the oldest of

which is making a name for himself at William Jewell College down in Missouri. It is some time now since I stopped in to see Ed Huckman at the Foxboro Company district office in New York City and those classmates who are in New York would be welcome to stop in and see Ed I am sure. He has one boy who is now in college and is living out at Pelham Manor, N.Y. His address is the Graybar Building. I received a short letter from Fred Walch a short time back and he is still in charge of Dewey and Almy Company sales on the continent. He and his wife, Irmgard, are living on a beautiful farm just outside of Paris and seem to be enjoying it a great deal.

"As for me, I am trying to guide the destiny of the field sales organization of the F. J. Stokes Machines Company, a small organization here in Philadelphia. We have five offspring ranging from 21 down to 10 years of age and as everyone knows who knows me, if I were to start telling you about them it would take pages. Besides, I then wouldn't have anything to talk about at the 25th reunion next June. See you then."

Frank's contribution was so excellent and detailed that he has unknowingly helped me out with next month's notes. There are letters from Charlie McHugh, Gordon Spear and a transcript of a letter from Bill Rivers to our Alumni Executive Vice-president, Lobby Lobdell '17; but I have gone over them carefully and each of them will be just as newsy next month, so I'm putting them in the reservoir. In other words, I'm making an easy time for myself with the February notes! So watch next month for the comments of our classmates mentioned above. — GEORGE WARREN SMITH, *General Secretary*, E. I. du Pont de Nemours and Company, Inc., Room 1420, 140 Federal Street, Boston 10, Mass.

## • 1936 •

Let's start this month's notes by saying, "A Prosperous New Year" to all of the Class and their families. May 1951 be the best year yet!

Responses to our letter of October 13 are still coming in and replies indicate that we will have a good turnout next June — let's make it a record-breaking reunion. In that connection, Fletch Thornton wants to report the following: "Your Reunion Committee will be complete when two of our Boston classmates agree to join up to give us the benefit of their advice. We line up at present with El Koontz in charge of publicity assisted by Hank Cargen. Gordon Thomas will handle our relations with the reunion hotel, and Mal Holcombe is the budget balancer. As the program is worked out, one man will be asked to take charge of each event; and Johnny Austin is already getting organized for the banquet. Rudy Ozol has promised to be on hand to promote a golf tournament when, as, and if enough able bodied citizens appear. On the indoors side, Harry Essley is going to solicit your snapshots, color slides and movie film far enough in advance of the big week end to prepare exhibits and a show.

"Your committee is in favor of inviting all of the wives who are able to get baby sitters. Unless we are disappointed, the hotel will be one of the resorts along the Connecticut or Rhode Island shore which will be easily reached by train, car or bicycle. We will be open for visitors Friday afternoon and the program will include interesting and exciting events through Sunday evening. A block of hotel rooms in Boston has already been reserved for Monday night after the Alumni Banquet and so has the room at the Copley Plaza for a class cocktail party before that dinner. These are part of the reunion, too! Our plans are being made on the basis of at least 125 persons appearing at the reunion sometime during the week end and we hope you will all put a ring around the dates, and put a dime in your old teapot every day. Suggestions and volunteers are welcome; for as the cards you sent in imply, this is our first real reunion in 10 years, and we want it to be one everyone will remember."

Frank Parker's reaction to the reunion is most favorable, and he states: "Suggest a stag affair from Friday noon to Saturday noon, at some modest New England hostelry having alcoholic beverage license and golf course." Dorian Shainin suggests: "Let's not have the reunion in Boston or any other city, but rather at a resort — something like our 5th." Dick Patterson comments: "Would like to see a reunion at a hotel — perhaps outside of Boston — with everyone bringing his wife." George Trimble writes: "Let's not have our reunion at the Parker House again. I vote for some place away from the city." Stan Johnson writes from Brussels, Belgium, where he is a metallurgical engineer covering northern Europe for the U. S. Steel Export Company, that he would like to be remembered to John Austin, Fletch Thornton, El Koontz, Gordon Thomas, and the rest of his classmates. He would like to be at the 15th reunion; and although he will be in the United States for a visit the early part of this year, he expects to return to Brussels before June. Too bad, Stan, it would be so nice to have you with us.

Had a nice long letter from Henry Lip-pitt. He is practicing law in New York, specializing in public utilities and regulatory practices, and is getting a lot of fun out of his efforts. He says he is one of the few men in the Class still unmarried. Is that a threat for all of us to get together, Hank, and try to change that status? George Parkhurst was glad to see the Class again represented in *The Review* — he thought perhaps we had become as extinct as the Dodo bird! Keep sending in news each month and make sure that never happens from here in! And, by the way, your Secretary will be answering each and every one of you one of these days real soon — even if he has to take a day off to do it. Incidentally, George reports that he is with International Equipment Company in Brighton, Mass., and gets over to the Institute library about once each week, giving him an opportunity to renew old acquaintances.

Since nearly 100 cards have come in since writing the notes for the December

issue of *The Review*, space does not provide an opportunity to bring you up-to-date on everyone. However, most of our fellows are well located, happily married, with one or more children — and looking forward to the reunion in June. Dick Halloran states that he is reminded to get busy on some of his unanswered correspondence from old comrades, so some of you should be hearing from Dick before too long. Bob Sherman is still teaching chemistry at Brown University and asks that we "Remember XYZ!"

Jack Hamilton is now in Burbank, Calif., with the Menasco Manufacturing Company. When he wrote to us, he was leaving on a business trip; but promised, upon his return, to let us have word of those of the Class with whom he comes in contact. Don't forget, Jack, we expect to hear from you again. Al Bagnulo tells us that he is located in the Office of the Chief of Engineers, Operations Division of Military Construction, Washington, and that he will be glad, at any time, to see members of the Class who might get to the Capital.

El Koontz sent out a number of letters asking for volunteers in connection with the 15th reunion, and as of this writing, the following have expressed their willingness to serve on the publicity subcommittee: Dick DeWolfe, Frank Parker, Eli Grossman, Ruddy Ozol, Martin Gilman, Ed Rowe, Bob Sherman, Hib Summersgill, Fred Prah, Tony Hittl, Ben Cooperstein, Roman Ulans, Henry Lippitt, George Crummey, Milner Wallace, Bill Garth, Dick Denton, Doug Cairns, J. L. Tobey, Bus Schliemann, Dave Varner, Web Francis, Frank Lessard, Jim Craig, Harold Miller, Ariel Thomas, Dick Halloran and Paul Robbins. El, fellows, will need plenty of assistance, so if you haven't written to him, do it now!

This is all for the present. See you next month — and we do promise a separate letter to everyone of you 157 wonderful fellows from whom we have received mail so far. — ROBERT E. WORDEN, *Secretary*, Fidelity-Philadelphia Trust Building, Philadelphia 9, Pa.

### • 1938 •

While in Syracuse, N.Y., Don Severance spent about a day and a half with Earle MacLeod. Earle is a project engineer with Carrier Corporation, where he is in charge of designing and developing their new automatic ice cube maker. Earle has been one of the most active members of the M.I.T. Club of Central New York, having been secretary-treasurer for two years, president this past year, and recently co-chairman of the Development Program's general campaign in the Syracuse area.

Earle and Don enjoyed an evening with Dick and Virginia Henderson at their new home in Fayetteville. Dick is now assistant professor of microbiology at the University of Syracuse, where he is working with Professor Jennison '27, formerly of the M.I.T. Faculty. Earle reported that Ray (Barney) Oldfield is currently in Syracuse at General Electric's new Electronics Park.

Don also mentioned seeing Shep Roberts at Schenectady. Shep is at the new

Knolls Laboratory of General Electric where he is working on a problem of dielectrics and phosphors. — ALBERT O. WILSON, JR., *General Secretary*, 24 Bennington Road, Lexington 73, Mass. RICHARD MUTHER, *Assistant Secretary*, Methods Engineering Council, 822 Wood Street, Pittsburgh 21, Pa.

### • 1940 •

I would like to begin this column by wishing each member of the Class a prosperous and happy year in 1951. Just when I was wondering if there were to be any '40 column in the January issue of *The Review*, I received a most welcome telephone call from Louis Michelson. After leaving Technology, Louis worked at the Corning Glass Works for a year. Then, from 1941 to 1945, he was in the Army at the Submarine Depot at Fort Monroe, Va. After being discharged from the Army, Louis went with the Sanborn Instrument Company for a year and next was general manager of the Allied Cement and Chemical Company for a year. Since 1947, he has been with the Naval Ordnance Laboratory at White Oak, Md., as chief of the mine and depth charge division. Louis married Florence Eisenberg in 1941 and they live with their daughter, Barbara, age seven, in College Park, Md. — Mr. and Mrs. Bernard F. Greene announce the arrival of Jonathan Henry Greene on October 16.

I am indebted to the newsclipping services for the next two items. John Berges, who has been with the Worthington Pump and Machinery Corporation in Holyoke, Mass., since graduating from Technology with us, has just changed over to the General Electric Company where he is in charge of the Refrigerator Compressor Laboratory at Fort Wayne, Ind. John is married to the former Margaret Golden of New Haven and they have three sons. The Norwood, Mass., *Messenger* of October 11, 1950, had an interesting article on Leonard Weaver who is director of the Neponset Choral Society in his spare time. He also has been active in the Milton Chorale Society and has sung the tenor lead in five annual performances of the latter group's presentation of Gilbert and Sullivan operas. Leonard works as a geologist with Bird and Son.

I believe it is the job of the Secretary to report about the activities of the other members of the Class and to keep his own appearance in the news items in this column to a minimum; but because of the scarcity of other items, I will give a summary of my activities since leaving the Institute. My first job was as a chemist with E. E. Bartos, Inc., a small allergen firm in New York. Next, I spent a year as a graduate assistant in chemistry at Carleton College, Northfield, Minn. Since July of 1942, I have been an examiner in the United States Patent Office, first in Richmond, Va., and then in Washington, D.C. In my spare time I have attended courses at the Polytechnic Institute of Brooklyn, at the University of Virginia, at the University of Richmond Law School and at the Georgetown University Law School. I received the LL.B. degree from the latter institution and am a member of the Vir-

ginia Bar and of the Bar of the Court of Customs and Patents Appeals. In June, 1948, I married Norma Samons and after living in several apartments we are now settled in our own home which we helped design.

Remember, - this is your column. It can only contain those items you send to the Secretary. So don't forget to write and please enclose your class dues — 50 cents for one year or \$2.50 for five years. — ALVIN GUTTAG, *General Secretary*, 7114 Marion Lane, Bethesda 14, Md.

### • 1941 •

Class members present at the American Institute of Chemical Engineers meeting at Swampscott enjoyed a small '41 "reunion." Dick Benzaquin, on the staff of A.I.C.E. headquarters in New York, took photographs of Thayer Rudd, Ted Ferris, Hank Avery and their wives. Alan Baum is working with classmate Bill Lifson at the Esso Standard Oil Company in Linden, N.J. Also, Pete Smolka is a patent attorney with Esso Standard. Ted Ferris is chief engineer of the Dehydrating Products Company and may be seen almost any morning around 9:00 A.M., making his way up Devonshire to 10 High Street, Boston, where his office is located. Jack Lyons is in the production department of the A. C. Lawrence Leather Company in Peabody, Mass.

We note that D. Reid Weedon's name appeared in print recently in a Boston *Globe* article concerning the Puerto Rican Development Company. Reid has been heading this program at Arthur D. Little, Inc. Sanford Glick was seen recently at the Society of the Plastics Industry meeting in Swampscott and at the Monsanto plastics plant where he is in charge of technical service for thermoplastic molding materials. He told us that Howie Samuels has his own business in Victor, N.Y. After Alan Surosky received his doctor's degree from Yale in engineering, he hung up his shingle as a chemical engineering consultant and formed a company called Metallizing Chemicals, Inc. Now he is vice-president of Northern-Zaleski, Ltd., of Long Island City. Their full-page advertisement appeared in the November issue of *The Review*.

All the above has come to us from Hank Avery who has agreed to act as associate secretary in an effort to keep the class notes coming on schedule. As to class affairs, we have no further progress to report on the 10th reunion as it is moving through the preliminary stages. You will be contacted directly by Reid Weedon as the plans develop. You can assist by answering mail from Reid promptly and by coming to the 10th reunion on the week end of June 9, 1951. Your preferences will be followed in planning the program, but you must tell us what they are. Reid's address is 4 Overlook Way, Winchester, Mass.

In Stamford, Conn., Don Jordan, who recently completed his Ph.D. work at the University of Delaware, has joined the staff of the Stamford research laboratories of the American Cyanamid Company. In our "haven't-heard-from-in-a-long-time" department is Howie Morrison who spent



three years in the Army in the United States, followed by 15 months on Guam. Discharged on February 12, 1946, Howie married Lydia Blake two days later, then took a long trip through California, and, later, through Massachusetts and New Hampshire. Another silent one is Charlie Britt who was last heard from when he was with the Skyway Broadcasting Corporation. He is married and has one child. Charlie was with the Headquarters, Materiel Command, Wright Field, Dayton, and graduated from uniform as a major. Last seen out on the board track at the Institute, Lewis Jester is in charge of Textile application work for the Boston office of General Electric. Geoffrey Roberts (married to Olive Smith) was working under Dr. Draper in the aeronautical laboratory.

Another long column has been received on the theatrical activities of Lars Nordenson who is combining chemical engineering with the producing of plays, in particular "The Bird Cage" coproduced with Walter Fried. Lars' father has been one of Sweden's most distinguished producers for years and for the last 12 years has been the chairman of the board of the Royal Dramatic Theater and Academy of Stockholm. Lars is working on a project at the moment which will bring several new Swedish plays to Broadway in adaption.

Elizabeth Spelts is engaged to John Stadig out in San Gabriel, Calif. Carol Joan is the new arrival at the home of Alan and Mrs. Surosky in Fair Lawn, N.J. And David Leslie tells of his arrival at the home of Leslie and Mrs. Corsa, Jr. You will remember that David's father is working hard to become a pediatrician, so care at the Corsa house will be of the highest caliber.

We regretfully and belatedly report the death, in 1947, of Alejandro Melchor, who was last with us at our 5th reunion. He was with the engineer board of the Army of the Commonwealth of the Philippines with the rank of colonel; was undersecretary of national defense of the Philippines in 1944, member of the Filipino Rehabilitation Commission, 1944-1945, delegate to the United Nations Conference on International Organization, 1945, military and technical advisor to the president of the Philippines, and member of the board of regents of the University of the Philippines. Colonel Melchor was awarded the Legion of Merit for his work on military bridges. — STANLEY BACKER, *General Secretary*, 335A Harvard Street, Cambridge 39, Mass. JOHAN M. ANDERSEN, *Assistant Secretary*, Saddle Hill Farm, Hopkinton, Mass.

#### • 1943 •

I hope you had a very merry Christmas and that the New Year will be happy and prosperous! Betty, young Clinton, and I spent Christmas in Hamilton, and drowned out the Old, and launched the New Year here, also. We drove to New York last Christmas, but enjoyed such unseasonably good weather both ways that we felt our weather "number" would be up and we shouldn't try it again this time!

It was on October 24 that Roberta and Virgil Otto together with their daughter

Phyllis became the proud parents and sister of Douglas Edward Otto. The young fellow was born at the West Suburban Hospital in Chicago and weighed eight pounds and seven ounces. Welcome to young Douglas and congratulations to all of the Otto's; incidentally, they are now living at 3035 North Kelmar Avenue, Chicago.

I have received a very pleasant note from Ellen and Loring Hosley giving news of their wedding which took place on September 9, 1950, in Our Lady of Sorrows Church, Mercerville, N.J. Ellen, whose maiden name was Faherty, formerly lived in Hamilton Square, N.J. The Hosley's are now calling Morristown, N.J., home. On October 14, the former Barbara Bezanson and William R. Blackwood were married in the Park Avenue Congregational Church in Arlington, Mass. After a reception in their honor at the Parish Hall, the Blackwoods motored through New England on their wedding trip. Bill is a mechanical engineer with the United Shoe Machinery Company. The Blackwoods are building a home in Beverly, Mass.

Victor C. Darnell has moved from New Britain to Kensington, Conn., and Harry Dixon from Decatur to Urbana, Ill. Dick, Betty and Susan Haas now call Monroe, La., home. They were formerly in White Plains, N.Y. From Elkins Park, Pa., Charles Hathaway has moved to Litchfield, Conn., while Eduardo Herrerias has gone to Guatemala City from Houston, Texas. George McMurtrie has left Gorham N.H., and now lives at State College, Pa. John Swift is at home in North Bergen, N.J.; he formerly lived in West Hartford, Conn. Richard Wade now resides in Saco, Maine, having moved from Lexington, Mass.

Well, Chums, that's all for now — happy New Year.—CLINTON C. KEMP, *General Secretary*, 29 Verlynn Avenue, Hamilton, Ohio.

#### • 1944 (2-44) •

Your Secretary wishes to apologize for his lack of news in The Review and hopes that he will be able to do better this year. Paul Heilman writes that he is traveling all over the country selling air conditioning for General Electric. He has run across Sten Hammarstrom in Detroit and Lew Tyree in Chicago. John Taft now has a second daughter and is residing in Elizabeth, N.J. Courtney Reeves has married Sally Sargeant of Seymour, Ind. He is working in New York. Dick Bettes is now settled down to married life, also. He married Donna Dailey of St. Paul, Minn. Don Phillips was an usher. Dick is with Standard Oil of Indiana and living in Chicago. Edgar Moor has married Joan Rothwell of Kingston, Mass. Dick Ward has also gone to the altar. He married Sarah Burton in Warrenton, N.C. They are presently making Warrenton their home. John Chamberlain married Ruth Howe of Hartford, Conn. John is an engineer at United Aircraft. Don Phillips is now married to Ruth Gretzinger of Glen Ellyn, Ill. Don is working for Corn Products Company of Argo, Ill. Henry Maier and Cynthia Locke are married and living in Santa Monica, Calif.,

where Henry is with Douglas Aircraft. John Gardner and Dorothy Dietrich are married and residing in Seymour, Conn.

Garry Myers is in the publishing business. He is promoting a children's magazine called *Highlights for Children*. Garry has four children, two boys and two girls. He, so far, is leading the Class in the family department. Beverley Tucker has changed from Chance Vought Aircraft of Dallas, Texas, and is now in the industrial engineering department of Geophysical Service, Inc., of Dallas. Your Secretary is also with that company after deciding to leave the air conditioning contracting business. Bev, since changing jobs, has become the proud papa of a boy.

Edward Jones of the Baldwin Piano Company has finished the production of a photoelectric organ. Generation of musical tones is accomplished by means of a photoelectric cell connected to an amplifier. Light reaches the cell from a rotating disc with apertures that scan stationary wave patterns similar to portions of movie sound tracks. A shutter system selectively lets light through any of 1,200 apertures, corresponding to 1,200 pipes in a pipe organ. Bernard Rabinowitz is now the father of a bouncing baby boy. He is living in Fairlawn, N.J. — WILLIAM B. SCOTT, *General Secretary*, 4412 Middleton Road, Dallas, Texas. MALCOLM G. KISPERT, *Assistant Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

#### • 1945 •

We are sorry that we were unable to make the December issue of The Review but at the time the class notes were due in Cambridge, yours truly was home in bed with that good old virus bug. Accordingly, we are including what we had hoped to include in the December column along with items for the January issue. Your class officers want to wish you a belated Merry Christmas and hope that this New Year shall be prosperous for you all. We do have a little information regarding class affiliations. I have personally contacted 122 fellows that were, at one time or another, affiliated with our Class at the Institute and hope that several of you, if you are reading this article now, will see fit to join the Class of 6-45, as it is hoped that we can make this Class one of the most outstanding classes that has ever graduated from the Institute.

Back in the early part of October, I received a letter from Ed Stoltz, one of our assistant secretaries from Wheeling, W.Va. Ed was previously located in Baltimore with the Johns-Manville Sales Corporation but was recently transferred to the woolly wilds of West Virginia. He is now selling about 1,500 Johns-Manville products throughout Ohio, Pennsylvania and West Virginia and; to be quite truthful, we wish the traveling salesman all the luck in the world. I have no idea how he will make out with the hill billies but trust that he will do as well as he did in the Baltimore region. Ed has the following comments to offer regarding several of our classmates and I thought it best to quote his letter herein.

"Saw Bill Shuman, XVI, in Baltimore recently. Bill married the boss's daughter,

has one child and is at present assistant general manager for the Nashua Brass Company of Nashua, New Hampshire. If anyone is in the market for small sized nonferrous castings made to critical tolerances, Bill is the boy to contact. Joe Aguila, II, and his beautiful wife Betty were very much in attendance at our fifth reunion week end having traveled all the way from Cuba for the event. Unfortunately, Betty was the only woman at the reunion but we know she had a good time. Joe at present is employed by Cia Azucarera Atlantica del Golsa at Havana, Cuba, and doing quite well, incidentally. Heard from Pete Schwab '47 of former *Voo Doo* and Course XVI fame. You well remember all those gorgeous girls Pete used to squire around, well, he finally married one of them—Madeleine Renee Guilfole—on November 12, 1949. Pete is employed by the Sperry Gyroscope Company as a field service engineer on automatic pilots and flight instruments and has many opportunities to play with the wild blue yonder in jets and blimps. Pete is one of the few of our classmates who has remained in engineering and in the same course as that which he studied.

"Spent a nice time with Sandy Neuhaus, X, while in Boston at the reunion. We roomed together at the Kenmore Hotel. Sandy is in the electroplating business with his Dad in Newark, N.J., is still single and looking fine. Received correspondence from Dick Nelson who was a special mathematics student. He is presently located at Harvard University as a teaching fellow in physics working for his Ph.D. I've heard also from Pete Agoston, X, who reports that he is still single and making penicillin for Charles Pfizer and Company of Brooklyn, U.S.A. Understand that Dan Vershbow, VI, recently married Ruth Marilyn Fine. Dan is employed by the Modern Dye and Machine Company of Boston and apparently is working quite hard. Frieda Osmansky Cohen, IV, writes telling us of her one son. Her husband, Felix Cohen, is a psychiatrist and they reside in Brookline, Mass.

"Ed Andrews, II, is also married having taken those vows in November of 1945. Ed and his charming wife have two children, ages one and one-half and three. He is employed by Brown Instrument division of Minneapolis-Honeywell at Jacksonville, Fla. The last word from Sam Moore, XIII, indicated that he was serving aboard the U.S.C.G.C. *Sagebrush* but expected to be transferred to terra firma in the United States sometime last June. Sam recently married Barbara Ann Wallace. Bill Niedhamer, II, is now a lieutenant commander in the United States Naval Reserve. He and his little woman are the proud parents of two small children and they reside in Temple City, Calif. Incidentally, Bill apparently is in the need of some 'hair growing tonic' so if any of you readers know where you can purchase this tonic, please let Bill know for I am sure he will appreciate our splendid interest.

"Jim Pickel, VI-A, is employed by Washington University of St. Louis, where he received his M.S. degree after leaving the Institute. Jim married Carolyn Free-

han of Lynn in November of 1946 and they now have a two-and-one-half-year-old boy, James, Jr. Jim Miller is slaving away at the Mellon Institute, Pittsburgh. He married Marjorie Souash in April, 1948, and they now have a one-and-one-half-year-old girl named Bonnie Lou."

As for information a little nearer home, I am pleased to say that we married our Class Prexy, Chick Street, off to Helen Marie Lawrence on November 4, 1950, in gay fashion. To put it mildly, it was a great reception but I'm sorry to say there weren't many fellows from the Institute there. The only person present from our Class was George (Curly) Bickford who was very much present with his recent bride. I am sure many of you will recognize the name, Frank Jones '47, one of the Dekes at the Institute who came all the way from South Carolina to see Big Chick get married. As some of you probably know, after leaving the Institute Chick worked for the Navy Department in Washington at the Model Base testing naval vessel models, but at the end of 1946 he saw the light and got into the fire insurance business. He joined the Factory Mutual Engineering division in Boston the early part of 1947 and at the present time is one of the engineers of the Manufacturers Mutual Fire Insurance Company in Providence.

Whether you realize it or not when you fellows and gals get your name in the local paper there's a good chance of the clipping turning up in The Review Office at the Institute from where the information is forwarded to me. So before turning to some of the questionnaires that we sent out last spring, I think it would be best if I caught up on some of the clippings I have received.

On July 1, 1950, Frank Gallagher and Matilda V. Crowley, both of Cambridge, were married at a double ring ceremony in St. Peters Church. A reception followed at the Hotel Sheraton. I don't think any of you are particularly interested in what the bride wore but you will be interested to learn that the bride attended Simmons College and Boston University and that both Frank and his wife are members of the United States Naval Reserve. It is sincerely hoped that both of them are members in an inactive status not an active status. It was a pleasure to read of Bill Blitzer's engagement in a September issue of the New York *Herald Tribune*. By now Bill will have completed two months of married life for on November 11 he was married to Judith Zana Lambert of New York City. At present Bill is employed as a products engineer with Lightolier, Inc., of Brooklyn. We had an excellent opportunity to visit with Bill during the reunion week end and learned that he spent a considerable amount of time after he got out of the Navy working at the Institute for the Bemis Foundation. Incidentally, Bill has become quite a sailor and we don't mean any battleship sailor for we're talking about a good old small-boat sailor.

We were very sorry to learn of the death of Dr. Otto E. Weilhamer who died in Mexico City during August after having been stricken with polio. Otto, as sev-

eral of you will recall, was with us during our V-12 days at the Institute.

On the brighter side again we got quite a charge out of an article that appeared in the Brookline, Mass. *Chronicle* on October 19, which told us the story about Justin Wyner who is a "ham" operator these days. From all indications, Jerry is having quite a time for himself in the evening as a "ham" and his days are spent peddling in greater Boston. I am sure all of you that were commuters back in '42 as well as those of us who were in Course XIII will be pleased to learn that Walt Kovalski is engaged to Mary Gertrude Powers of Brighton. We have no idea what Walt's doing at present but he is probably, like so many of us, not in the engineering field. If you happen to read this article Walt, how about dropping us a line and giving us the word on what you are doing? I don't know, but it seems that everyone is getting married or engaged these days for here is another marriage notice. Seems that on June 20 last year, Jeanne Wolf became the bride of George M. Berman. Since graduating from the Institute, George has received his M.B.A. from the Harvard Business School. We must thank C. A. Clarke, Secretary of the Class of 1921, for the following marriage notice. On May 27 of last year Dorothy Louise Miller of Englewood, N.J., was married to Robert Stevens Buxton. Bob's wife graduated from Duke University in 1948; and since Bob's graduation from the Institute, he has received his master's degree from Lehigh University and has been an instructor in the mechanical engineering department there for the past two years. At present he is employed by the Alan A. Wood Company of Philadelphia.

As for class activities, it is hoped that in the very near future we will be able to get out to everyone of you a class letter which will outline our plans in great detail. Briefly, we have the following ideas in the planning stage; and, if any of you have sufficient interest, we would greatly appreciate your comments on these before they are completed. You all know that it takes money, or should I say capital, to run any business organization and to be truthful much the same holds true in running any class activities. At the present time, we owe the Alumni Association of the Institute well over \$100 and it would appear that the best method of repaying the Institute, and still keep ourselves solvent, would be to set up class dues in the amount of \$1 per year. This may come as a shock to some of you but I think you will all realize, upon thinking it over, that if we are to become a strong class and keep up communications among our members, it would be an excellent idea to start off with class dues.

The second matter that we wish you would think about is that of a 25-year gift. I know you will all remember that June day in 1945 when we sat in New England Mutual Hall watching our class day festivities. To me, and I know that the same probably holds true with you, the gifts the Institute received that day were tremendous. It is hoped that some of our classmates have the fortune and the desire at the time they come back for their 25th re-



union in 1970 to give as generously as did several of the members of the Class of 1920 gave in June of 1945; but with taxes the way they are now, it seems improbable that any of us will accumulate sufficient funds to accomplish such a generous deed. It appears that the simplest and most logical method of raising funds for a 25-year gift would be through some personal insurance program. This could be developed one of several ways but the two most prevalent methods in use are as follows:

The first method is that of insuring one's self for a nominal amount of, should we say \$1,000, with the dividends which accrue during the next 20 years being made payable to the Institute at the end of the 20-year period. The selling point in this policy appears to be the fact that you would have this \$1,000 worth of insurance for the 20-year period and after the 20 years the dividend which would accrue would be payable to you rather than the Institute. — The second method is that of insuring two or three classmates on a 20-year endowment basis, with the endowment at its maturity being payable to the Institute. In reality, this method of obtaining funds is less expensive for individuals in the Class but it is quite obvious that one does not have any insurance coverage as a class member. As far as that goes, neither does the person that is being insured for if he should die within the 20-year period the policy would be payable to the Institute at the time of his death.

I appreciate the fact that these last two paragraphs have brought these class notes to an end with a sober note, but I thought it best to bring this matter to your attention so that you could think it over and I promise you we shan't mention it again until we send out notices to you all. So, what do you say, let's think it over and we will see you in the February issue. — CLINTON H. SPRINGER, *General Secretary*, 44 Church Street, Bristol, R.I. *Assistant Secretaries*: WILLIAM J. MCKAY, 15 Barrett Street, Needham, Mass., EDWARD STOLTZ, JR., Johns-Manville Sales Corporation, 505 Laconia Building, Wheeling, W.Va.

## • 1948 •

More and more men of '48 are becoming betrothed and exchanging nuptial vows, according to the latest news releases. Engagements announced during September and October include those of: Joan Brandmeyer to Frank Heilenday, who is currently employed as an engineer by Consolidated Vultee Aircraft in Fort Worth; Mary Tompkins to James Starkweather, assistant to the chief engineer of Hollingsworth-Whitney, paper manufacturers in Waterville, Maine; Edith Schweser to George Dundon; and Jane Lindsey to Perry Nies, who is now a first-year man at Harvard Business School.

Weddings, or at any rate their announcements, were more numerous: Pearl Gilmore became the bride of Wilbur Widmer, an assistant professor of sanitary engineering at Storrs Institute; Cynthia Baldwin was wed to Bill Hosley; Guitelle Hurvitz to Bob Sandman; Barbara Leavitt to Al Edwards, who is now employed as a

research engineer at United Aircraft; Louise Debevoise to John Winninghoff, currently on active duty in the Army Air Forces; Margaret Stueck to Bob Welsh, industrial engineer with the Ludlow Manufacturing Company; Jean Murray to James Connors; Paula Gelb to Irving Kagan, who is assistant superintendent of the Penobscot Shoe Company in Old Town, Maine; and a Technology coed, Katharine Franck to Oscar Huettnier, both of whom are associated with the Airborne Instruments Laboratory in Mineola, L.I.

News releases have been received concerning two of our many classmates who are now in the Armed Services: Alexander Urquhart, now Lieutenant, j.g., Urquhart, recently received his naval aviator's wings, while Bob Day conducts classes in the elements of chemical engineering for the Army Chemical Center at the University of Maryland. — Recently, the National Bureau of Standards announced the completion of SEAC, the first automatically sequenced, superspeed, electronic computer to be put into actual operation; and instrumental in its development was Merle Andrew, who received his doctor's degree in mathematics with our Class. Another member of '48, by virtue of having received his doctorate in that year, is Wilfred Roth, who has just organized the Rich-Roth Laboratories to conduct research and development programs in automatic industrial controls and computers, electronics, and general engineering analysis.

And last year's questionnaires are still coming in. Bill Oard, who is now a groom of some seven months, is with the Modern Talking Picture Service in New York promoting the showing of sponsored 16-millimeter sales promotion movies. Cleveland Gregg Bassett has taken a position on the staff of the City Planning Commission in Philadelphia, after a period of teaching town planning and architecture at the University of Michigan. Charles Licht is plant manager for Specialloy, Inc., in Chicago; Johnnie Benjamin has been touring Connecticut helping to organize and advise community school study groups for that state's Fact Finding Commission for Education; and Jay Lathrop, who is teaching at the Institute, has collaborated with Professor Buechner to take the first actual photographs of the atom.

Ronald Brightsen is now employed at the Westinghouse atomic division in Pittsburgh. Also engaged in atomic work are: Harvey Willard who, after receiving his Ph.D. at M.I.T., accepted a position as senior physicist at the Oak Ridge National Laboratory; John Lamarsh, who has received an Atomic Energy Commission scholarship for the continuation of his studies in theoretical physics; and David Peaslee who, after completing his work as an AEC fellow in Zurich, Switzerland, was appointed assistant professor of physics at Washington University in St. Louis.

Charles Winnick is studying for his Ph.D. at the University of Illinois and was recently awarded an industrial research chemistry fellowship by the Eastman Kodak Company; John Christopher is attending the Harvard Business School on a regional scholarship; Bob Abelson has

been appointed to an Educational Testing Service psychometric fellowship at Princeton for full-time study toward a doctorate in psychology; and Clifford Ham is preparing for the Christian ministry at Andover-Newton Theological Seminary. — WILLIAM R. ZIMMERMAN, *General Secretary*, in care of Kurt Salmon Associates, Inc., 3000 Albemarle Street, Washington, D.C. RICHARD H. HARRIS, *Assistant Secretary*, 19 Lancaster Street, Worcester, Mass.

## • 1949 •

The mailbox gave forth with a letter from Ed Miller relating that he "worked as a research physicist for Columbia University off the coast of Bermuda, studying properties of under water sound . . . now working half time on contracted research in geophysics and taking graduate work in geology and physics at Columbia . . . saw Ted Madden in Bermuda when his ship, the *Atlantis*, a Woods Hole oceanographic research vessel, put into port . . . was married." (see below) Another appreciated epistle stated, "as of 7:00 A.M., the undersigned is no longer associated with the Professional Equipment Company, manufacturers of X-ray machines, but instead is a member of the Armed Forces. Am reputed to be going to Ft. Leonard Wood — thence?" signed, Bud Bezark.

Keith Boyer has been appointed to the staff of the Los Alamos Scientific Laboratory. Lieutenant Isham Linder was designated a naval aviator the 13th of September. Preflight and basic were taken at Pensacola and advanced multiengine aboard the Naval Air Station, Corpus Christi, Texas. He is now attached to the Pacific fleet. Howard MacFarland has been appointed instructor in electrical engineering at Lehigh University. Bertram Collins is a member of the industrial engineering staff of Atlantic Refining, Philadelphia. Jack Barriger was appointed traveling car agent for the Atchison, Topeka, and Santa Fe. Lieutenant Emiel Meisel has been designated a naval aviator and is now with the Pacific fleet.

ENGAGEMENTS: Louis Basel to Penelope Giatrelis of Hamden, Conn. David Boyd to Alice Brumback of Annapolis, Md. Robert Collins to Catherine Meisner of Akron, Ohio. Bob is with B. F. Goodrich. Leo Dunn to Helen O'Brien of Cambridge, Mass. William Howlett to Virginia Ford of Chevy Chase, Md. Bill is with the American Can Company. Richard Lang to Betty White of Belmont, Mass. Robert Lovell to Lila Kobel of Amesbury, Mass. Bob is a customer engineer with IBM. Stanley Margolin to Roslyn Praise of Newton, Mass. Henry Rowen to Beverly Griffiths of Westwood, Calif. Herbert Spivack to Gloria Richmond of Brookline, Mass.

WEDDINGS: Edward Boston to Lois Deputy on September 2 in Plainfield, N.J. Best man was Van Tuyl Boughton. Ed is with Esso Laboratories of Baton Rouge. Charles Carver to Florence Mallory on September 16 in Amherst, Mass. Charles is instructing civil engineering at the University of Massachusetts. Charles Currie to Norma MacLeod on September 16 in Boston, Mass. Charles is a member of the

Pierce Consulting Engineering Company of Boston. John Dalton to Elizabeth Wise on September 2 in Akron, Ohio. John is with Pailen Appliance Company, Cleveland. George Felbeck to Mary Nichols on September 23 in Dedham, Mass. Nisson Finkelstein to Rona Glassman on September 3 in Boston. Isaac Foster to Arline Paustian on August 26 in Manitowoc, Wis. Arthur Halenbeck to Joan Smith on September 30 in Winnetka, Ill. George Clements was best man. Art is with Hazel-tine Electronics Corporation, New York. Robert Kramer to Ruth Rosen on August 27 in Boston. Bob is completing graduate work at Technology. Stan Loomis to Carol Pope on October 21 in Newark, N.J. Edward Miller to Lois Vaetsch on September 30 in Brattleboro, Vt. Fred Newton to Caroline Harrison on October 21 in Danville, Va. Clifford Noll to Muriel Sawyer on September 16 in Melrose, Mass. Warren Obes to Janet Hughes on September 23 in Manhasset, L.I. Raymond Oransky to JoAnn Rothenberg on September 3 in Nashua, N.H. Chester Patterson to Jean Parsons on October 21 in New Bedford, Mass. Chet is with the Beetle Boat Company of New Bedford. Sherwood Stockwell to Mary Windsor on September 9 in Pittsburgh, Pa. Rush Taggart and Ed Wilson ushered. Edward Stoessel to Janet Pray on October 7 in Laconia, N.H. Ed is with Thompson Starrett Company of New York. Donald Sprague to Margaret Morgage on September 16 in Augusta, Me. Having attended the University of California graduate school, Don is now a hydraulic engineer for the Federal Bureau of Reclamation in Sacramento. Joseph Stern to Phyllis Swett on August 26 in Boston. — CHARLES WILLETT HOLZWARTH, *General Secretary*, Mellon BC-44, Harvard Business School, Soldiers Field, Boston 63, Mass.

## • 1950 •

Recruit John Weaver reporting the activities of the Army to the Class of 1950. One thing about this New Army, it is interesting. It also seems to be fond of college reunions because we are having one here at Fort Dix. Bob Mahar'49, I, is in the next bunk over from mine. He was inducted the same day I was and we've been together ever since. We are not alone, though. Joe Medney, II, and Jerry Koch, XIV, are both making like soldier boys up the street a way. Up six barracks

and over two, we have a soldier who thinks the Army is making a big mistake in training him. But the Army thinks it has a place for Mr. (excuse me, Recruit) Mike Celentano, I. Jimmy Chin, also of Course I, is around the post somewhere awaiting orders. Ulysses Pournaras, XIII, was also in my battery for a while but he shipped out to Fort Bragg. I'm sure there are many more members of our loyal Class in Uncle Sam's Army; and if I keep up at the rate I've been going, I should see you all by the second Wednesday of next week.

However, while I have been taking orders from top sergeants, I notice that many of my brothers have been taking orders from Dan Cupid. I have news of 11 engagements and *beaucoup* weddings. The following lucky girls have become engaged to even luckier fellows: Barbara Taylor Martin to Robert C. Stout, Aulikki Valve to Kenneth H. Olsen, Sarah Josephine Saxelby to Sidney A. Corderman, Anne Audrey Foxman to Lawrence G. Sirkis, Florence Anne Tankel to Warren Marcus, Barbara Anne Ormerod to Richard Counihan, Jean Frances Dennett to James P. Gay, Joyce Audrey Spaulding to William R. Dagnall, Jr., Marjorie Scranton Platt to Kent Moore, Mary Jean Humphrey to William H. Enders, Diana Dana to Robert E. Kendall, and Isabelle White to George R. Spencer.

WEDDINGS: Alice Lorraine Stokes to James A. Daley, Pheobe Groggin to Murray Garden, Marilyn Jeanne Thomas to Donald A. Young, Nancy Parker Schwarzwaelder to William C. Bibb, Jr., Alice Mary Reilly to Fred J. McGarry, Florence Volk to Bernard Gregory, Jean Ann Copinger to J. Raymond Gaffey, Jr., Constance Sylvia LeClaire to Arthur J. Solari, Joanne Therese Levins to Robert C. Weber, Jean F. Field to John J. Mohr, Nancy Woods Hoff to Eric E. Anschuetz, Virginia Lowell to John Douglas Yerger, Jr., Priscilla Ripley to Wendell G. Sykes, Elizabeth Coles to Alan Shaw, Harriet Mansur to Jack J. Jackson, Ira June Hawthorne to Robert F. Sadowski, Phyllis Hampton to George E. Spaulding, Jr., Joann E. Acker to James B. Thomas, Jean Beatrice Peters to Richard A. Butterworth, Moira O. Cummings to Robert E. Lyons, Dawn Phyllis Dawn to Clayton W. Williams, Elinor Fairchild to Robert H. Stebbins, Lois Jeanne Erwin to Thomas Godfrey, Eleanor Mara Aiba to Samuel C. Bidwell, and Ethel Jo-Anne Curran to

Fred W. Adams, Jr. Oh, yes, my old roommate at M.I.T. finally found an apartment in Waterbury and has settled down to married life. Good luck, Charlie and Cindy Lusher.

I have received word that John H. MacMillan is one of the 85 outstanding students from 24 countries to be awarded a Rotary Foundation fellowship for advanced study abroad. He is specializing in gas turbines at the College of Sciences and Technology in South Kensington, England. Robert Plouffe is working with Philco in Philadelphia. Earle W. DuBois is employed by Western Electric in Pittsburgh, and Richard Spencer is working for the Eckert Mauchly Company of Philadelphia. Frank Ruccia was working on a project at Technology last summer and recently has joined the Monsanto Chemical Company in Cambridge. Jack Cord is still working on his project at M.I.T. He decided that commuting from Saranac Lake was taking too much time so he married "His Liz" and they have settled down in Boston.

Mr. and Mrs. Mann have become Technology's most popular chaperons. I was up to see them in October and Bob and Margaret were busy chaperoning Halloween dances, acquaintance dances, and parties of all sorts. I've been doing some chaperoning of my own these past few weeks. They handed me an M-1 rifle and told me to take care of it.

Jim Buttercup Butterworth wrote to the student staff at Walker that he is enjoying himself at the University of Nebraska. He also informs us that Roy Hale is in the Air Forces in Texas. Roy has his commission, so he should be pretty well off. — Received news of more weddings: Virginia Ann Smith to William R. Bidermann, Barbara Virginia Meads to Raymond Fitzmaurice, and Margret Lois Logan to Ajay Kumar Bose. Last, but not least, Jean Flemming has become engaged to Philip J. Byrne.

This news may seem a bit scrambled but I'm still in basic training and my time is not my own. I hope to be shipped soon to a semipermanent station, and the news of the Class will be coming to you with a little more care thereafter. Till then, continue to send your news to my home address. Thank you all. — JOHN T. WEAVER, *General Secretary*, 1772 East Tremont Avenue, Bronx 60, New York.



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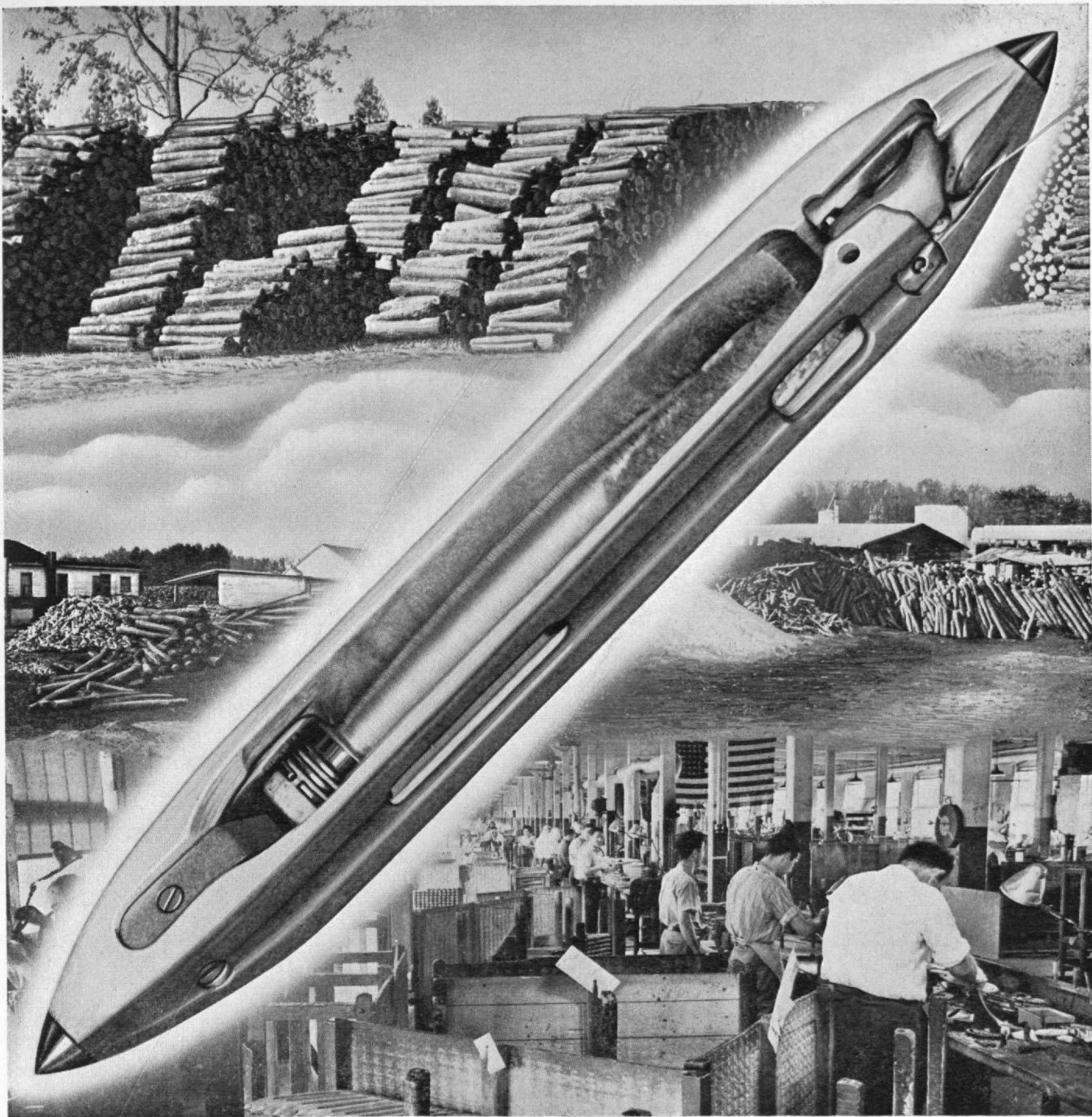
**Please send me.....of the standard 10-inch record-  
ings of "Songs of M.I.T." at \$1.25 each, postpaid.**

**Enclosed is my check for \$.....made payable to  
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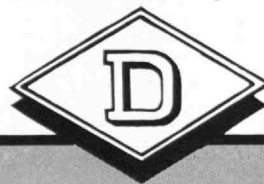
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For decades, Draper Corporation has carried out research on various species of wood from all over the world, on synthetics and on other materials from which to make shuttles, but dogwood reigns supreme.

As a result, more than 35 small saw mills from Virginia to Louisiana supply our Biltmore, North Carolina Shuttle Block Mill and our Hopedale Shuttle Finishing Department with the finest of dogwood.

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**TYPE 1303-A**  
**TWO-SIGNAL GENERATOR**  
**\$1050**

## a *New* Two-Signal Audio Generator

**Ideal for Non-Linear Tests On: ★ Audio Amplifiers ★ Hearing Aids ★ Filter Networks ★ Noise Suppressors ★ High-Efficiency Speech Reproducing Systems ★ Loudspeakers ★ F-M Systems with Pre-Emphasis ★ Recording Systems ★ Any System of Restricted Frequency Range**

The new G-R Type 1303-A Two-Signal Audio Generator supplies signals by the beat-frequency method. Three oscillators and three mixers are used to provide a number of output-signal combinations. The output of the mixers are combined in a linear adding network and then amplified through a very low-distortion power amplifier. The output from the amplifier is fed into a 600-ohm attenuator system, with a voltmeter to monitor the level at the input of the attenuator. The harmonic content and inter-modulation products in the final output are at a very low level. High stability of voltage and frequency are provided. The frequency drift from cold start is only a few cycles.

*This A-F Signal Generator will supply the following signals:*

- A single low-distortion sinusoidal voltage, adjustable in frequency from 20 cycles to 40 kilocycles, in two ranges.
- Two low-distortion sinusoidal voltages, each separately adjustable, one to 20 kc and the other to 10 kc.
- Two low-distortion sinusoidal voltages with fixed

difference in frequency maintained between them as the frequency of one is varied. The fixed difference frequency is adjustable up to 10 kc, and the lower of the two frequencies is adjustable up to 20 kc.

The output is continuously adjustable and is calibrated both in volts and in db with respect to 1 mw into 600 ohms. The frequency calibration can be standardized within one cycle at any time. Its accuracy is  $\pm (1\% + 0.5 \text{ cycle})$ .

*This generator is an excellent and versatile signal source for the three standard non-linear distortion tests:*

1. The widely used harmonic distortion test.
2. The intermodulation method that evaluates distortion in terms of the resultant modulation of a high-frequency tone by a low-frequency tone.
3. The difference-frequency intermodulation test, which evaluates distortion in terms of the amplitude of the difference-frequency components produced by inter-modulation of two sinusoidal test signals of equal amplitude.

**Write for Complete Information**



# GENERAL RADIO COMPANY

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